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SOV/137-58-11-23401

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 222 (USSR)

AUTHORS: Druzhinin, V.V., Kudryavtsev, I.P.

TITLE: On the Dispersion of the Recrystallization Texture in Cold-rolled Electrical Steel (O rasseyanii tekstury rekristallizatsii v kholodnokatanoy elektrotekhnicheskoy stali)

PERIODICAL: Metallovedeniye i termoobrabotka. Moscow, Metallurgizdat, 1958, pp 88-94

ABSTRACT: Optical methods were employed in studying the degree of completeness of recrystallization texture (DPRT) in production batches of steels E310 and E330. It was established that the DPRT affects the magnetic properties of steel. Specimens possessing high magnetic-induction characteristics exhibited a high DPRT in the planes (110) [100], the [100] plane in the plane of rolling deviating from the direction of rolling by ± 5°; specimens with poor magnetic properties exhibited a (100) [100] texture rotated by ± 10-15° within the plane of rolling.

A.B.

Card 1/1

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VIGLIN, A.S.; KUDRYAVTSEV, I.P.

Determination of the degree of perfection of texture in polycrystalline ferromagnetics. Part 1: General function characterizing the degree of perfection of the crystallographic texture of cold rolled electrical steel and the possibility of its determination by experiment. Fiz. tver. tela 1 no.2:256-260 F '59. (MIRA 12:5)
(Steel--Metallography)

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VIGLIN, A.S.; KUDRYAVTSEV, I.P.

Determination of the degree of perfection of texture in polycrystalline ferromagnetics. Part 2: Approximation of the distribution function p( ), characterizing the degree of perfection of texture of cold rolled electrical steel. Fiz. tver. tela 1 no.2:261-264 F '59. (MIRA 12:5)

1.Ural'skiy politekhnicheskiy institut im. S.M. Kirova, Sverdlovsk.
(Steel--Metallography)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

AUTHOR: Kudryavtsev, I. P. SOV/126-7-3-33/44

TITLE: On the Determination of the Degree of Perfection of the Texturing (Anisotropy) in Polycrystalline Ferromagnetics. 2. The Use of the Function $p(\gamma)$ in the Explanation of Some Experimentally Observed Regularities (K voprosu ob opredelenii stepeni sovershenstva tekstury v polikristallicheskikh ferromagnetikakh. 2. Primeneniye funktsii $p(\gamma)$ k ob"yasneniyu nekotorykh eksperimental'no nablyudayemykh zakonomernostey)

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 3, pp 461-463 (USSR)

ABSTRACT: In a previous paper (Ref 1) the authors found an analytical expression for the function $p(\gamma)$ which characterizes the degree of anisotropy in cold rolled electrical steel. In the present paper a study is made, using the function $p(\gamma)$, of the behaviour of the amplitudes of the harmonics of the curves of the mechanical moment on changing over from one grade of steel to another. In order to obtain results which are more generally valid, the author did not consider a specific form of the function $p(\gamma)$. The form of the function $p(\gamma)$ obtained using the amplitudes of the harmonics of the curves of the mechanical moment are

Card 1/3

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On the Determination of the Degree of Perfection of the Texturing (Anisotropy) in Polycrystalline Ferromagnetics. 2. The Use of the Function $p(\gamma)$ in the Explanation of Some Experimentally Observed Regularities

compared with those obtained by means of the optical method in Fig 1 for a better grade steel and in Fig 2 for a steel of a lower grade. According to the data given in an earlier paper (Ref 1) the amplitudes of the harmonics A_2 and A_4 decrease in absolute magnitude with increase in dispersion of the tetragonal grain axes relative to the direction of rolling and A_4 decreases more rapidly than A_2. This dispersion is characterized by a parameter σ given by Eq (1). In Fig 3 the experimentally determined dependence of A_2 and A_4 on σ are plotted and it follows from Eq (4) that A_4 has a greater dependence on σ than A_2; this is in agreement with experimental results. In the last paragraph the dependence of A_2 and A_4 on σ, determined by measurements on models of cold rolled electrical steel, is discussed. The model consisted of two single crystal discs which are superimposed and have the following crystallographic orientation: the plane (110) is coincident with the plane

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On the Determination of the Degree of Perfection of the Texturing (Anisotropy) in Polycrystalline Ferromagnetics. 2. The Use of the Function $p(\gamma)$ in the Explanation of Some Experimentally Observed Regularities

of the sheet; the direction [100] is coincident with the direction of rolling. The model was used to study A_2 and A_4 as functions of ϑ, the angle between the tetragonal axes of the discs. In Fig 4 the dependence is plotted of A_2 and A_4 on ϑ, obtained experimentally on models of cold rolled steel. Due to the high experimental error in the harmonics A_6 and A_8 (50-70%), no conclusion can be derived concerning the dependence of A_6 and A_8 on ϑ.

Acknowledgments are expressed to V. I. Arkharov and A. S. Viglin for commenting on the results and for useful advice. There are 4 figures and 3 Soviet references.

ASSOCIATION: Ural'skiy politekhnicheskiy institut imeni S.M.Kirova (Ural Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: February 10, 1958

Card 3/3

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E192/E382

AUTHOR: Kudryavtsev, I.P.

TITLE: The Problem of Determining the Quality of the Texture of Polycrystalline Ferromagnetics

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, Nr 1, pp 203 - 207 (USSR)

ABSTRACT: The hypothesis of Druzhinin and Kudryavtsev (Refs 1,2), asserting that in cold-rolled electrical steel a spread of the orientations of the tetragonal axes [100] with respect to the rolling axis is observed, permits the construction of a model of cold-rolled electrical steel on which it is possible to study the characteristics. The model is in the form of two monocrystalline discs superimposed on each other; these have the following crystallographic orientation: the plane (110) lies in the plane of the disc, while the direction [100] is selected on the surface of the disc. The discs are obtained from the standard industrial cold-rolled steel from which it is possible to grow grains having a transverse dimension of 3 - 4 cm by means of a prolonged heat treatment.

Card1/5

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E192/E382

The Problem of Determining the Quality of the Texture of Polycrystalline Ferromagnetics

The crystallographic uniformity of the grains is determined by the optical method (Ref 4). The anisotropy of such a system of discs depends on the angle Ψ between the directions [100] of the individual discs. If $\Psi = 0$, the sample behaves as a monocrystalline disc. When Ψ is increased, it is possible to simulate various degrees of texture quality of the sample. It is necessary to find the relationship between the disperions of the angle Ψ and the amplitude of the harmonics of the mechanical-torque curve of the sample and to verify the following formula (Refs 2, 5) which was derived by another method:

$$A_n = nb_n \cos n\sigma_\Psi \qquad (1) .$$

In this equation A_n is the amplitude of the n-th harmonic of the mechanical-torque characteristic,

b_n is a linear function of the constants of the crystallographic anisotropy and

Card2/5

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The Problem of Determining the Quality of the Texture of Polycrystalline Ferromagnetics

the dispersion σ_ψ is defined by Eq (3), where Q_l is the relative volume of each disc which is equal to 1/2 . It is assumed that the mechanical-torque characteristic of one of the monocrystalline discs is expressed by (with an accuracy to 4 terms):

$$M = A_2 \sin 2\varphi + A_4 \sin 4\varphi + A_6 \sin 6\varphi + A_8 \sin 8\varphi \qquad (4) .$$

In this A_2, A_4, A_6 and A_8 are the amplitudes of the harmonics and φ is the angle between a given direction at the surface of the disc and the external magnetic field. If two discs are combined at an angle Ψ, the resulting torque is expressed by Eq (9). This can also be written as Eq (10), where B_2, B_4, B_6 and B_8 are the amplitudes of the harmonics of the resulting mechanical-torque characteristic. In general, the

Card3/5

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The Problem of Determining the Quality of the Texture of Polycrystalline Ferromagnetics

amplitudes are expressed by Eq (11) but since $\psi/2 = \sigma_\psi$, the amplitudes are given by:

$$B_n = A_n \cos n \sigma_\psi \qquad (12) .$$

However, according to Kudryavtsev and Giglin (Refs 2, 5), $A_n = nb_n$. Consequently, B_n can be expressed by Eq (13). In practice, the characteristic of the mechanical torque of the system of two monocrystalline discs, whose torque characteristics are known, can be constructed graphically. Such a curve is shown in Figure 2, in which the "solid" curve represents the resulting mechanical torque for $\psi = 30^\circ$. Figure 3 shows the dependence of the amplitudes B_2 abd B_4 of the torque characteristic on the angle ψ ; these curves were constructed graphically. The circles in the figure represent the experimental points which were obtained by means of the Akulov magnetometer. It is seen that the experimental points coincide with the

Card4/5

4

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E192/E382

The Problem of Determining the Quality of the Texture of Polycrystalline Ferromagnetics

theoretical curves. From the above it is concluded that Eq (13) is in good agreement with the experiment. There are 3 figures and 5 Soviet references.

ASSOCIATION: Ural'skiy politekhnicheskiy institut imeni S.M.Kirova (Ural Polytechnical Institute imeni S.M. Kirov)

SUBMITTED: December 27, 1958

Card 5/5

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

S/170/60/003/03/18/034
B014/B007

AUTHOR: Kudryavtsev, I. P.

TITLE: The Inhomogeneity of the Crystallographical Texture in the Cross Section of a Plate of Cold-rolled Transformer Steel

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 3, pp. 105-109

TEXT: The investigations described here were carried out on a transformer-sheet, the composition of which is given, and which had been produced at the Novo-Lipetskiy metallurgicheskiy zavod (Novo-Lipetsk Metallurgical Factory). Cold-rolling was carried out in two variants. In the case of the first the individual reductions per working operation were 2 - 3%, in the second they were 20 - 30%. Measurements of the moment were made by means of the magnetometer developed by N. Akulov (Ref. 2). In Fig. 1 moment-curves for various total reductions are shown. From the discussion of these curves it follows that because of the symmetry of the rolling process, the intermediate layer, which in samples of more than 0.75 mm thickness, occurs beside the middle- and the surface layer, is characterized by a considerable dispersion of the crystal surface (100) round the direction of rolling. Proceeding from the distribution function (2) for the orientation of the

Card 1/2

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The Inhomogeneity of the Crystallographical Texture in the Cross Section of a Plate of Cold-rolled Transformer Steel

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grains, it is shown that the structure of the intermediate layer is not perfectly axial. In the case of high deformation rates cracks form at the boundaries of the layers, and in Fig. 2 a sample is shown, in which a crack was caused by too high a rolling rate. Here deformation in one travel amounted to 60%. The difference in the structure of the layers is, as experiments made by annealing at 800°C in hydrogen atmosphere showed, not fully removed, even after annealing for 10 hours. Fig. 4 shows graphically the influence exerted by thermal treatment on the curves of the moment. Annealing, as shown by these diagrams, practically influences only the course of the moment-curve of the middle layer. There are 4 figures and 3 references: 2 Soviet and 1 German.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S. M. Kirova, g. Sverdlovsk (Ural Polytechnic Institute imeni S. M. Kirov, City of Sverdlovsk)

Card 2/2

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

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E111/E352

AUTHOR: Kudryavtsev, I.P.

TITLE: Recrystallisation Texture of Cold-rolled Electrotechnical Steel

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 6, pp 939 - 940 (USSR)

ABSTRACT: In this letter to the editor the author briefly develops his previous observations (with Druzhinin - Ref 1) on the distribution function for grain orientation in industrial cold-rolled electrotechnical steel. He deduces an equation relating the amplitudes of mechanical-moment harmonics to functions of the angle between direction of rolling and the [001] direction. Values calculated for various steels are tabulated together with those found optically (Ref 1). There are 1 table and 4 references, 3 of which are Soviet and 1 is German.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S.M. Kirova (Ural Polytechnical Institute im. S.M. Kirov)

SUBMITTED: November 17, 1959

Card 1/1

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E073/E382

AUTHOR: Kudryavtsev, I.P.

TITLE: Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol. 10, No. 1, pp. 29 - 36

TEXT: The problem of non-uniformity of the texture along the cross-section of cold-rolled materials has so far been little studied. Of greatest interest in this respect is the work published by Möller and Stäblein (Ref. 1) who also investigated the nature of scattering of the crystallographic structure in the centre, and in the neighbourhood of the surface, of cold-rolled silicon iron (total reduction 92%). They found that although the type of texture in these layers remains unchanged, the scatter in the texture along the layers differs in character, whereby the highest amount of scatter is observed in the external layer. The increase in the scatter of the texture in the external layer should lead to a decrease in the magnitude of the mechanical moment generated by a rotating

Card 1/11

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Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

magnetic field in the external layer after separating it from the cold-rolled material (for instance by etching) as compared to material from the internal layers. This phenomenon has been experimentally observed by the author (Ref. 2). Apparently the relation governing the changes along the layers of the mechanical moment can be derived from the character of the distribution of the orientation of the crystallites of the cold-rolled material in a manner analogous to that obtained for industrially produced cold-rolled electrical steel (Refs. 3, 4). It is shown that the dependence of the intensity of reflected X-rays I on the angle γ between the normal to the rolling plane and the normal to the crystallographic plane (200) corresponds to the function of the distribution of the orientation of the grains $p(\gamma)$ with an accuracy of up to a constant coefficient. A concrete form of the function $I(\gamma)$ for the internal and external layers of the cold-rolled alloy is given in a figure for the case of a total reduction of 92%. The relationship

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E073/E382

Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

between the function $p(\gamma)$ and the curves of the mechanical moment can be determined by finding the analytical dependence of the harmonic amplitudes A_2 and A_4 of the mechanical moment on the shape of the function $p(\gamma)$. For this purpose, it is assumed that the mutual position of the 3 tetragonal axes and the coordinate system corresponding to the case considered is in the form shown in Fig. 2, the caption to which is: Mutual position of the unit vectors $\vec{i}_k$, $\vec{j}_\ell$, $\vec{\gamma}_\ell$ and $\vec{n}$. It is assumed that $\vec{i}_k$ is the unit vector of the k-th axis of the coordinate system such that $\vec{i}_1$ is parallel to the direction of rolling, while $\vec{i}_2$ lies in the plane of rolling but is perpendicular to $\vec{i}_1$; $\vec{j}_\ell$ is the unit vector of the ℓ-th axis of the coordinate system corresponding to the triplet of the tetragonal axes, while $\vec{n}$ is the unit vector of the

Card 3/11

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Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

direction of magnetisation. The expression for the free-energy density of a textured sample is in the form:

$$F = k_1(\alpha_1^2\alpha_2^2 + \alpha_2^2\alpha_3^2 + \alpha_3^2\alpha_1^2) \qquad (1)$$

where k_1 is a constant of crystallographic anisotropy, while

$$\alpha_1 = (\vec{n}\vec{j}_1), \quad \alpha_2 = (\vec{n}\vec{j}_2) \text{ and } \alpha_3 = (\vec{n}\vec{j}_3) .$$

By introducing the condition of perpendicularity for the vector $\vec{j}_1$ and $\vec{j}_2$, the free energy F can be expressed as a function of γ and φ. Now the average value of the free energy is defined as

Card 4/11

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Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

$$\bar{F} = \int_{-\pi/2}^{\pi/2} p(\gamma)F(\varphi, \gamma)d\gamma \qquad (4)$$

and the mechanical moment is determined by finding the minimum of $\bar{F}$, i.e.

$$M = - \partial\bar{F}/\partial\varphi \ .$$

On the basis of Eq. (4) it is therefore possible to determine M and hence the amplitudes of the harmonics of the curves of the mechanical moment. These amplitudes are expressed by:

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E073/E382

Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

$$A_2 = 2k_1 \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \left(\frac{1}{64} - \frac{1}{16}\cos 2\gamma + \frac{3}{64}\cos 4\gamma\right) p(\gamma)\, d\gamma.$$

$$A_4 = 4k_1 \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \left(\frac{7}{256} + \frac{7}{64}\cos 2\gamma - \frac{3}{256}\cos 4\gamma\right) p(\gamma)\, d\gamma.$$

The variation of A_2 and A_4 from layer to layer can be determined if the distribution function $p(\gamma)$ for the grain orientation is known. It is assumed that $p(\gamma)$ is in the form of a superposition of three distribution functions

Card 6/11

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E073/E382

Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

$$p(\gamma) = P(\gamma + a) + P(\gamma - a) + B(\gamma) \qquad (7).$$

By introducing new variables $\gamma + a = x$, it is possible to express A_2 and A_4 in terms of the functions of Eq. (7). However, the main quantity of interest is the difference between the values of A_2 and A_4 for an internal and an external layer. These differences are expressed by

$$\delta A_2 = \frac{2k_1}{3}\,(0{,}150 \sin 2a_1\, 2\delta a_1 e^{-\sigma^2} - 0{,}075 \sin 4a_1\, 4\delta a_1 e^{-4\sigma^2}),$$

$$\delta A_4 = \frac{4k_1}{3}\,(-0{,}264 \sin 2a_1\, 2\delta a_1 e^{-\sigma^2} + 0{,}018 \sin 4a_1\, 4\delta a_1 e^{-4\sigma^2}.$$

Card 7/11

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E073/E382

Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

where a_1 is the value of a for an internal layer and the distribution function $P(x)$ is given by:

$$P(x) = \frac{D}{\sigma} e^{-x^2/\sigma^2} \qquad (15) .$$

A number of experiments have been carried out to compare the calculated and experimental values of δA_2 and δA_4 . The experiment gave $\delta A_2 = 0.30 \times 10^4$ erg/cm^3 and $\delta A_4 = -2.7 \times 10^4$ erg/cm^3 ; the calculated values corresponding to the same conditions were $\delta A_2 = 0.43 \times 10^4$ erg/cm^3 and $\delta A_4 = -3.1 \times 10^4$ erg/cm^3 . It is seen, therefore, that the experiment is in good agreement with the theory.

Card 8/11

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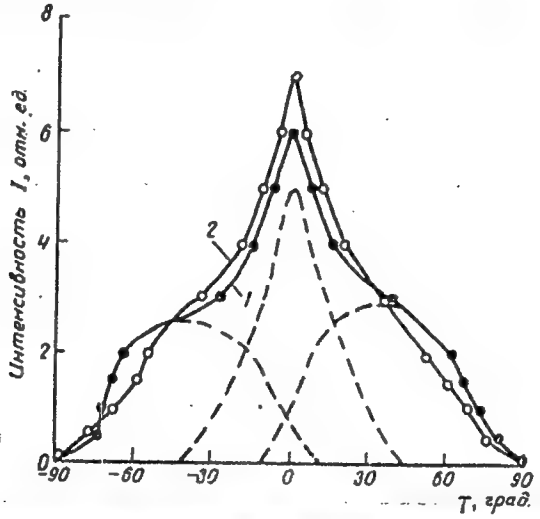
E073/E382

Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

There are 2 figures and 7 references: 5 Soviet and 2 non-Soviet.



Card 9/11

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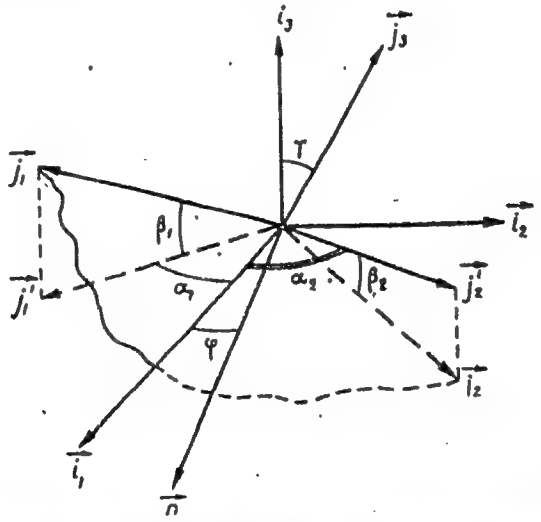
Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)



Card 10/11

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Certain Features of Scattering in the Texture of Cold-rolled Transformer Steel (Total Reduction 92%)

ASSOCIATION: Ural'skiy politekhnicheskiy institut imeni S.M. Kirova (Ural Polytechnical Institute imeni S.M. Kirov)

SUBMITTED: September 16, 1959 (initially)
November 19, 1959 (after revision)

Card 11/11

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

S/126/60/010/005/004/030
E193/E483

AUTHOR: Kudryavtsev, I.P.

TITLE: On the Possibility of Compensation of the Mechanical Moment in the Case of Cubic Texture of Transformer Steel

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.5, pp.661-667

TEXT: There is a non-equivocal relationship between the spatial distribution of the orientation of grains and the curve of the mechanical moment $M(\psi)$, where ψ is the angle between the magnetization of the specimen and direction of rolling. Although the shape of $M(\psi)$ is equivocally determined by the texture of the material, to each $M(\psi)$ curve there may correspond several types of scatter of the orientation of grains. Consequently, $M(\psi) \equiv 0$ is only a necessary condition for the absence of texture. It has been shown by Bryukhatov et al (Ref.2) that in a nickel specimen which, at a given stage of the treatment had $M(\psi) \equiv 0$, well pronounced cubic texture of recrystallization developed after annealing. The obvious inference is that this compensation of the

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E193/E483

On the Possibility of Compensation of the Mechanical Moment in the Case of Cubic Texture of Transformer Steel

mechanical moment is associated with certain specific features of the scatter of the texture which have not yet been investigated. Consequently, the object of the present investigation was to study the distribution of orientation of grains in specimens of transformer steel, characterized by a cubic texture and $M(\psi) \equiv 0$, and to show analytically that a specimen with a given distribution of the orientation of grains should, in fact, have $M(\psi) \equiv 0$. A steel, containing 2.47% Si, 0.07% C, 0.4% Mn, 0.031% P, 0.028% S, 0.06% Cr and traces of aluminium, was used in the experiments. Hot-rolled strip (120 x 60 x 5 mm) was cold-rolled to 0.96 mm thickness, annealed at 800°C for 1.5 h, pickled, cold-rolled again to 0.25 mm thickness and, finally, annealed in hydrogen at 1200°C for 12 h. Back-reflection X-ray technique was used to study the texture of the specimens whose $M(\psi)$ at room temperature was determined with the aid of a rotating magnetometer in fields of not less than 3000 Oe. Specimens, annealed for various periods shorter than 12 h, were examined in

Card 2/3

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E193/E483

On the Possibility of Compensation of the Mechanical Moment in the Case of Cubic Texture of Transformer Steel

the same manner. The results indicated that variation in the distribution of orientation of grains (with no change in the type of texture) can be accompanied by qualitative changes in the anisotropy of the mechanical moment so that, even in the case of pronounced cubic texture, conditions may exist when $M(\Psi) \equiv 0$. It was concluded that when the processes of texture formation are studied, the magnetic method should be supplemented by more direct methods of determining the texture. Acknowledgments are made to M.I.Nekrasov, G.A.Zykov, V.I.Shilov, V.V.Druzhinin, F.A.Sidorenko and Yu.M.Gertman for assisting in the work.
There are 5 figures and 8 references: 3 Soviet and 5 Non-Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im.S.M.Kirova
(Ural Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: January 6, 1960 (initially)
March 29, 1960 (after revision)

Card 3/3

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.P.

Magnetic texture analysis effected on coarse-grained specimens of cold-rolled transformer steel. Izv.vys.ucheb.zav.; fiz. no.5:49-54 '61. (MIRA 14:10)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.
(Steel--Electrometallurgy)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.P.; DRUZHININ, V.V.

Heterogeneity in the distribution of texture and internal stresses in the cross-section of a cold-rolled sheet of electrical steel. Fiz. met. i metalloved. 11 no. 5:752-758 My '61. (MIRA 14:5)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova i Verkh-Isetskiy metallurgicheskiy zavod.
(Steel—Metallography) (Sheet steel)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

S/196/62/000/001/003/013
E194/E155

AUTHOR: Kudryavtsev. I.P.

TITLE: The use of Bitter's method to determine the amount of texture in cold-rolled electrical steel

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.1, 1962, 4, abstract 1B 19. (Tr. Ural'skogo politekhn. in-ta, no.114, 1961, 23-31)

TEXT: An analysis is made of the applicability of Bitter's method (determining the texture in sheet materials from the amplitude of harmonics of mechanical torque curves, which are communicated to a disc-shaped specimen in a uniform magnetic field) for weakly-expressed textures. For commercial transformer steel there is a good agreement with experiment, so that the method can be used for industrial control of the extent to which texture is developed in such steels. It is shown that Bitter's equations are not inconsistent and that they can be used to explain why analysis of magnetic texture is not single-valued when the texture is very clearly expressed. 12 literature references.

Card 1/1 [Abstractor's note: Complete translation.]

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

S/058/62/000/005/096/119
A061/A101

AUTHOR: Kudryavtsev, I. P.

TITLE: Anisotropy of the mechanical moment of ferromagnetics with a cubic lattice

PERIODICAL: Referativnyy zhurnal, Fizika, no. 5, 1962, 71, abstract 5E541 ("Tr. Ural'skogo politekhn. in-ta", 1961, sb. 114, 32-40)

TEXT: The problem of representing the free energy of a ferromagnetic crystal by a series of direction cosines and that of the decrease of the anisotropy constants in the series with an increase of their ordinal number are considered. The experimental relations between crystal symmetry and free energy, which are given, prove the correctness of conclusions, based on the relativistic quantum theory, regarding the dependence of the magnitude of anisotropy constants on their ordinal number.

B. Karpenko

[Abstracter's note: Complete translation]

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

S/137/61/000/011/077/123
A060/A101

AUTHORS: Radovskiy, I.Z., Kudryavtsev, I.P.

TITLE: On textural non-homogeneity along the sheet cross section of cold-rolled commercial nickel

PERIODICAL: Referativnyy zhurnal.Metallurgiya, no.11, 1961, 42, abstract 11Zh254 ("Tr. Uralskogo politekhn. in-ta", 1961, coll. 114, 41 - 46)

TEXT: The original specimens of commercial Ni, 2 mm thick, obtained from ingots by combined hot and cold rolling, were subjected to recrystallization annealing at 850°C for 5 hours. The cold rolling was carried out both directly and reversibly (the specimens were always inserted with the same end into the rolling rolls in the first case, and alternately with one and the other end in the second). Using both these variants, the specimens were rolled down to total reductions of 10, 40, 50, 75 and 85%. Layers were etched out of the sheets obtained, parallel to the specimen surface. The 15-20 mm diameter disks cut out of these layers were subjected to investigation. The qualitative variant of magnetic textural analysis was at the basis of the investigation method of the specimen texture. The mechanical moment was measured on a torsion magnetometer at room temperature

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A060/A101

in fields of not less than $\geqslant$ 3,000 oersteds. The A_4 harmonic of the curve of mechanical moment was utilized as the quantity defining the texture. It was established that the amplitude of A_4 drops sharply from the middle to the surface of the specimen, testifying to the most intensely expressed texture being in the middle layer and least pronounced in the outside layer. The pattern indicated holds down to the very highest total reductions studied (85%). This result corresponds to the analogous data obtained earlier for transformer steel. By means of magnetic textural analysis it was demonstrated that cold-rolled commercial Ni possesses considerable magnetic non-homogeneity. In its effect upon the amplitudes of the harmonics of the mechanical moment curve, the magnetic non-homogeneity of the specimens is equivalent to geometrical defects and within the limits of measurement errors has no influence upon the amplitude of A_4. There are 10 references.

L. Gordiyenko

[Abstracter's note: Complete translation]

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.P.; FINKEL'SHTEYN, S.D.

Effect of the divergence of X-ray beams on the results of determining the crystallographic texture of cold-rolled transformer steel. Trudy Ural. politekh. inst. no.127: 119-126 '61. (MIRA 16:8)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

ADAMESCU, R.A.; KUDRYAVTSEV, I.P.

Effect of a magnetic field on the recrystallization texture in silicon iron. Fiz. met. i metalloved. 16 no.6:837-841 D '63. (MIRA 17:2)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.P.

Modern methods of preferred orientation analysis in metals and alloys (survey). Zav.lab. 29 no.4:439-446 '63. (MIRA 16:5)
(Alloys—Metallography)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.P.

Texture of the 50% Fe - 50% Ni alloy following hot rolling. Fiz. met. i metalloved. 17 no.1:140-141 Ja '64. (MIRA 17:2)

1. Ural'skiy politekhnicheskiy institut im. S.M.Kirova.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

ADAMESKU, R.A.; KALININ, V.M.; KUDRYAVTSEV, I.P.

Effect of annealing in a magnetic field on the magnetic and crystalline structure of ferrosilicon. Izv. vys. ucheb. zav.; fiz. no.5:69-74 '64. (MIRA 17:11)

1. Ural'skiy politekhnicheskiy institut imeni Kirova i Ural'skiy gosudarstvennyy universitet imeni Gor'kogo.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

ADAMESKU, R.A.; KUDRYAVTSEV, I.P.

Effect of annealing in a magnetic field on the magnetic and crystalline structures of ferrosilicon with weakly expressed crystallographic texture. Izv. vys. ucheb. zav.; fiz. no.5:184-185 '64. (MIRA 17:11)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, Igor' Pavlovich

[Textures in metals and alloys] Tekstury v metallakh i splavakh. Moskva, Metallurgiia, 1965. 292 p.
(MIRA 18:5)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

ADAMESKU, R.A.; KUDRYAVTSEV, I.P. [deceased]; FAYTEL'SON, I.M.; GEL'D, P.V.

Characteristics of texture formation during the cold [illegible] of silicon iron with low and medium degrees of deformation. Izv. vys. ucheb. zav.; chern. met. 8 no.10:106-109 '65. (MIRA 18:9)

1. Ural'skiy politekhnicheskiy institut.

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59
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Kudryavtsev, Igor' Pavlovich 44,55

Textures in metals and alloys (Teksturv v metallakh i splavakh) Moscow, Izd-vo "Metallurgiya", 1965. 292 p. illus., biblio.

TOPIC TAGS: metal, alloy, metal analysis, crystallography, metal physical property, meatl coating, plastic flow, magnetic property, electric property, crystal anisotropy, solid mechanical property

PURPOSE AND COVERAGE: The book presents the results of research on crystallographic textures in metals and alloys, and examines methods of analizing the textures and corresponding apparatus. It also presents an anisotropy of the physical properties of textured materials and its connection with texture. The mathematical calculations are given. The book is intended for engineers-metallurgists and metallo-physicists, scientific workers of the corresponding specialties, and can also be useful for students and those specializing in the physics of solids, the physics of magnetic phenomena and the physics of metals.

Card 1/2

14

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TABLE OF CONTENTS (abridged):

Foreword — 7

Introduction — 9
Ch. I. Classification and description of textures — 13
Ch. II. Texture analysis — 18
Ch. III. Texture in ingots and precipitated layers — 101
Ch. IV. Textures of plastic flow — 120
Ch. V. Recrystallization textures — 162
Ch. VI. Anisotropy of the mechanical properties of textured materials — 227
Ch. VII. Anisotropy of magnetic, thermal and electrical properties of textured materials — 248
Ch. VIII. Basic problems in studying textured materials — 271

SUBMITTED: 11Feb65

SUB CODE: SS, MM

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NO REF SOV: 189

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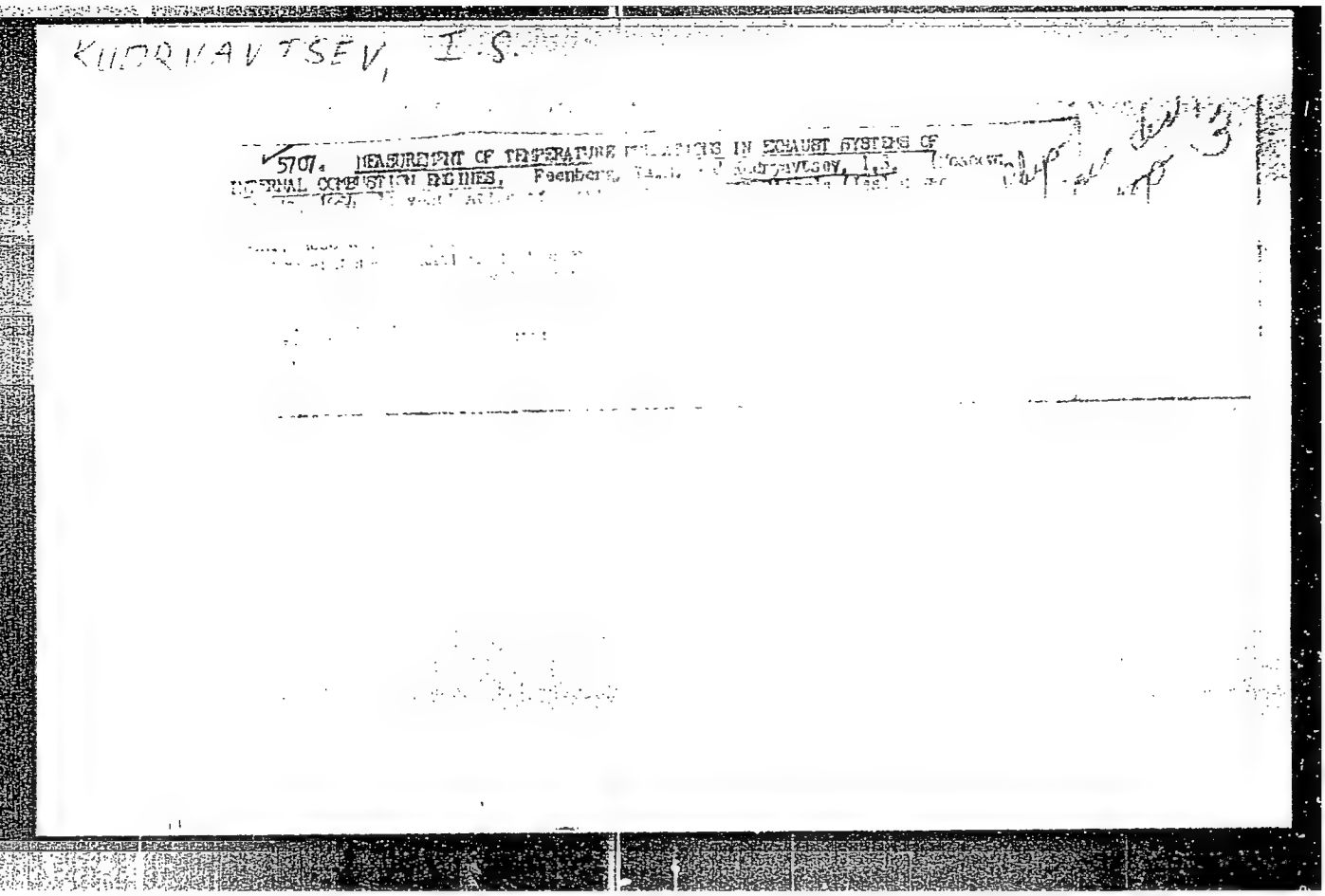

KUDRYAVTSEV, I. S.

5707. MEASUREMENT OF TEMPERATURE FLUCTUATIONS IN EXHAUST SYSTEMS OF INTERNAL COMBUSTION ENGINES. Feenberg

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

ACCESSION NR: AT4042297 S/0000/63/003/000/0195/0201

AUTHOR: Ivashchenko, N.I., Kudryavtsev, I.S., Fedorovich, Ye. D.

TITLE: Results of tests of electromagnetic induction pumps for the pumping of sodium and mercury

SOURCE: Soveshchaniye po teoreticheskoy i prikladnoy magnitnoy gidrodinamike. 3d, Riga, 1962. Voprosy* magnitnoy gidrodinamiki (Problems in magnetic hydrodynamics); doklady* soveshchaniya, v. 3. Riga, Izd-vo AN LatSSR, 1963, 195-201

TOPIC TAGS: hydromagnetics, induction pump, liquid metal pump, sodium pumping, mercury pumping, electromagnetic pump

ABSTRACT: Electromagnetic induction pumps of the plane-linear type with a traveling magnetic field and having the nomenclature IN-9 for sodium pumping at temperatures up to 700 C and IN-10 for mercury pumping at temperatures up to 100 C were produced according to the plans of the Institut fiziki Akademii nauk Latviyskoy SSR (Institute of Physics of the Academy of Sciences of the Latvian SSR). The construction of both pumps is similar and is described in some detail in the article. In the case of the IN-10 the channel is of Kh18N10T steel in the form of a plane slot 10 by 150 mm in size. The

Card 1/3

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channel of the IN-9 pump was also in the form of a flat slot with a section having dimensions of 7 X 130 mm. Two longitudinal baffles were placed in the channel for the purpose of evacuating the cavity of the pump. The inductor windings, in this case, had a triangular connection arrangement. The IN-10 was fed through a 3-phase current transformer with the voltage regulated between 20 and 220 volts; the In-9 — from the 220 volt AC three-phase net through a step-down transformer. The experimental stands and the test technique are described in the article. The pumps were tested by connecting them to circulation systems in the form of closed loops of tubing. The sodium flow was measured by a magnetic flowmeter, the mercury flow - by means of a nozzle with the readings transmitted to a manometer. A compensation manometer was used in the measurement of the sodium pressure. The authors discuss the results of the tests in some detail. It was found that the IN-9 induction pump can be successfully employed with laboratory sodium instrumentation for long periods at temperatures up to 600C. The IN-10 is capable of protracted mercury pumping operations at a temperature up to 100C and voltages up to 110 volts. Design modifications are required if the pump is to operate at higher voltages. Orig. art. has: 5 figures.

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ACCESSION NR: AT4042297

ASSOCIATION: none

SUBMITTED: 04Dec63 ENCL: 00 SUB CODE: IE, EM

NO REF SOV: 001 OTHER: 000

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ACC NR: AT6001353 JG/GS SOURCE CODE: UR/0000/65/000/000/0063/0065

AUTHOR: Kolechev, D. M.; Kudryavtsev, I. S.; Paskar', B. L.; Yakubovich, I. I.

ORG: Central Boiler and Turbine Institute im. I. I. Polzunov (Tsentral'nyy kotloturbinyy institut)

TITLE: Application of a method for high frequency induction heating of metallic heat carriers

SOURCE: Teplo- i massoperenos. t. 1: Konvektivnyy teploobmen v odnorodnoy srede (Heat and mass transfer. v. 1: Convective heat exchange in an homogeneous medium). Minsk, Nauka i tekhnika, 1965, 63-65

TOPIC TAGS: heating, liquid metal, heat carrier

ABSTRACT: In industrial practice for heating in a high-frequency magnetic field, the specific heat flux is practically independent of temperature and can reach values up to approximately 10^7 kilowatts/meter^2. The article describes experiments made with laboratory equipment on a heavy metal alloy and on a light alkali metal. The inductor in the experiments was a solenoid with a diameter of 0.065 meters and a length of 0.450 made from a copper tube with a cross section of 10 x 10 and a wall

Card 1/2

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ACC NR: AT6001353

thickness of 0.0015 meters. In the heavy alloy loop, the coil of the inductor covered a section of the alloy loop, which consisted of a tube with a diameter of 0.05 meters and a wall thickness of 0.0025 meters, inclined at an angle of approximately 30° to the vertical and made of Kh18N10T steel. The light metal was heated by the inductor in a vertical tube with a length of 0.5 meters and an outside diameter of 0.044 meters and made of Kh18N10T steel. The voltage on the leads of the high frequency generator could be set within the limits of 0 to 750 volts. Measurements were made of the power of the generator, the voltage and current strength, temperatures of the metal and the cooling medium at the inlet and outlet of the inductor, and the feed rates of the metal and the cooling medium. For the heavy alloy, the load on the generator was varied within the limits of 25 to 80 kilowatts. Five series of runs were made with a total duration of 110 hours. The runs were made at a constant rate of feed of the alloy equal to approximately 20,000 kg/hour. Depending on the conditions, the temperature of the alloy varied from 473 to 773°K. For the light metal the load was 80 kilowatts, the average temperature in the heater was approximately 1123°K, and the feed rate of the metal was about 2,000 kh/hour. The inductor was operated under these conditions for approximately 150 hours. Results are shown graphically. It is concluded that the method is suitable for practical application. Orig. art. has: 2 figures. Liquid metals 18

SUB CODE: 20/ SUBM DATE: 31Aug65/ ORIG REF: 003/ OTH REF: 001

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KUDRIAVTSEV, Ivan Vasil'evich.

KUDRIAVTSEV, Ivan Vasil'evich. Methods of strengthening surfaces of machine parts. Moskva, Gos. nauch. tekhn. izd-vo mashinostroit. lit-ry, 1949. 220 p. (50-15808)

T3320.K8

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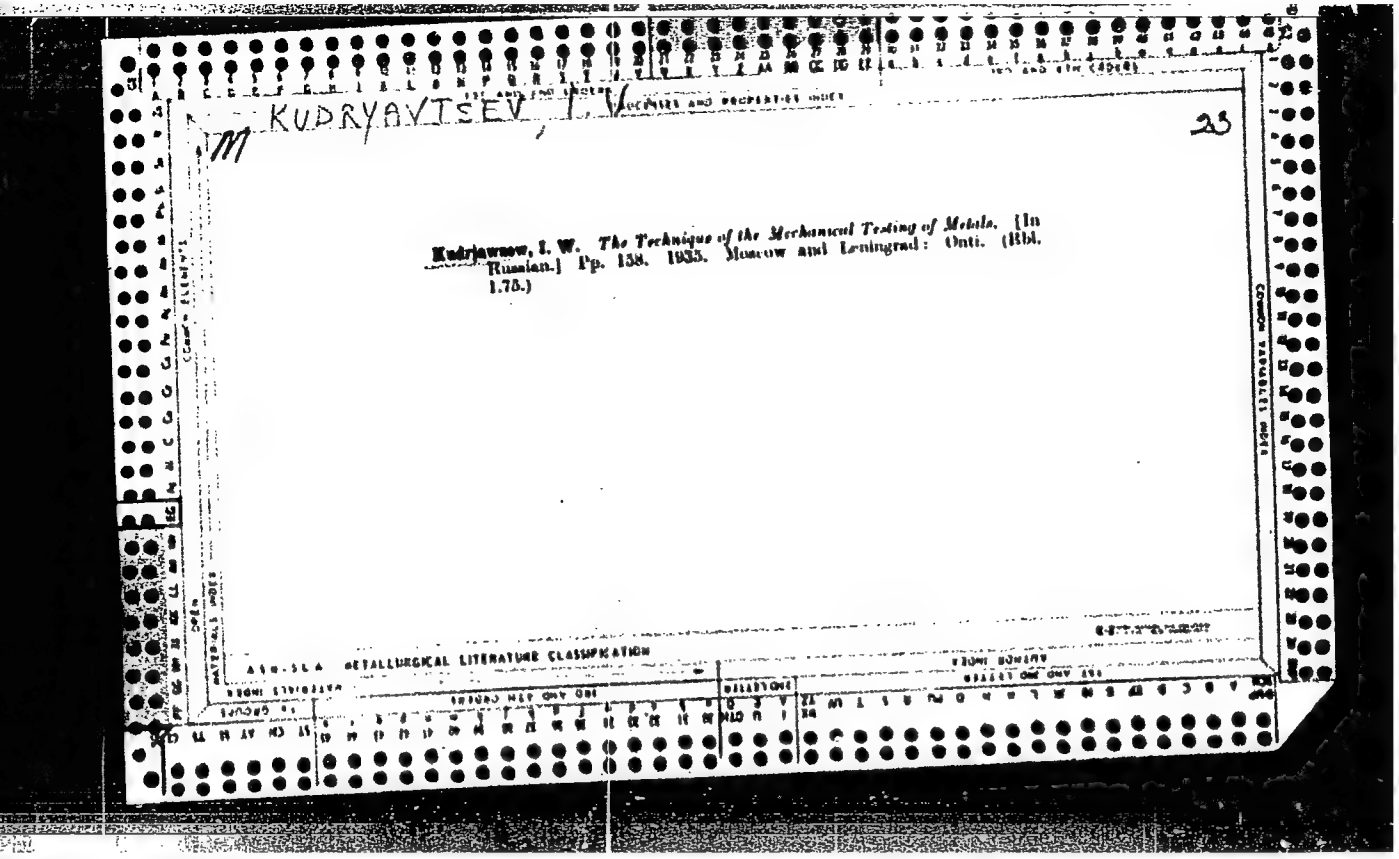

KUDRYAVTSEV, I. V.

23

Kudrjawzew, I. W. *The Technique of the Mechanical Testing of Metals.* [In Russian.] Pp. 138. 1935. Moscow and Leningrad: Onti. (Rbl. 1.75.)

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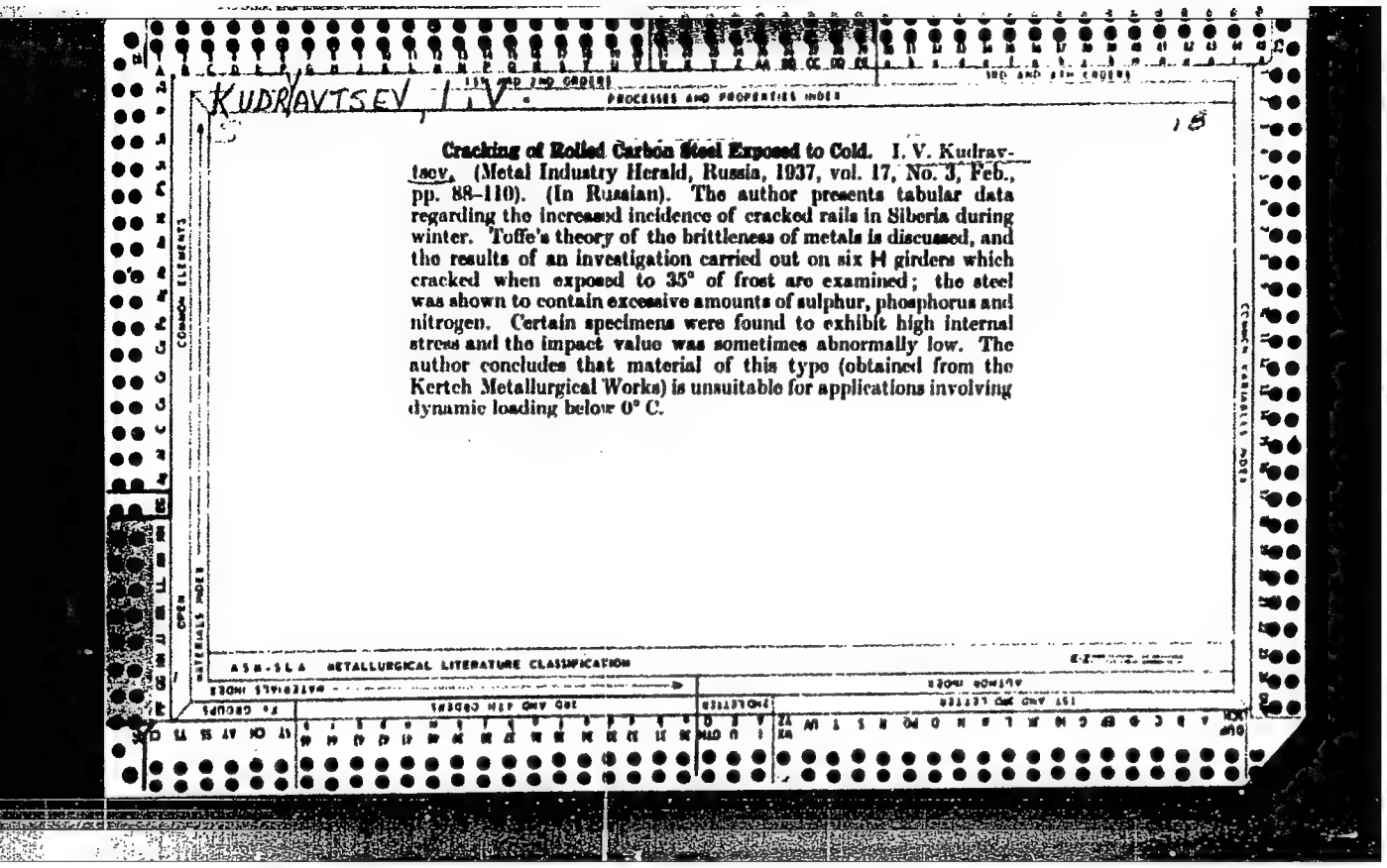

KUDRAVTSEV, I. V.

PROCESSES AND PROPERTIES INDEX

18

Cracking of Rolled Carbon Steel Exposed to Cold. I. V. Kudravtsev. (Metal Industry Herald, Russia, 1937, vol. 17, No. 3, Feb., pp. 88–110). (In Russian). The author presents tabular data regarding the increased incidence of cracked rails in Siberia during winter. Toffe's theory of the brittleness of metals is discussed, and the results of an investigation carried out on six H girders which cracked when exposed to 35° of frost are examined; the steel was shown to contain excessive amounts of sulphur, phosphorus and nitrogen. Certain specimens were found to exhibit high internal stress and the impact value was sometimes abnormally low. The author concludes that material of this type (obtained from the Kertch Metallurgical Works) is unsuitable for applications involving dynamic loading below 0° C.

METALLURGICAL LITERATURE CLASSIFICATION

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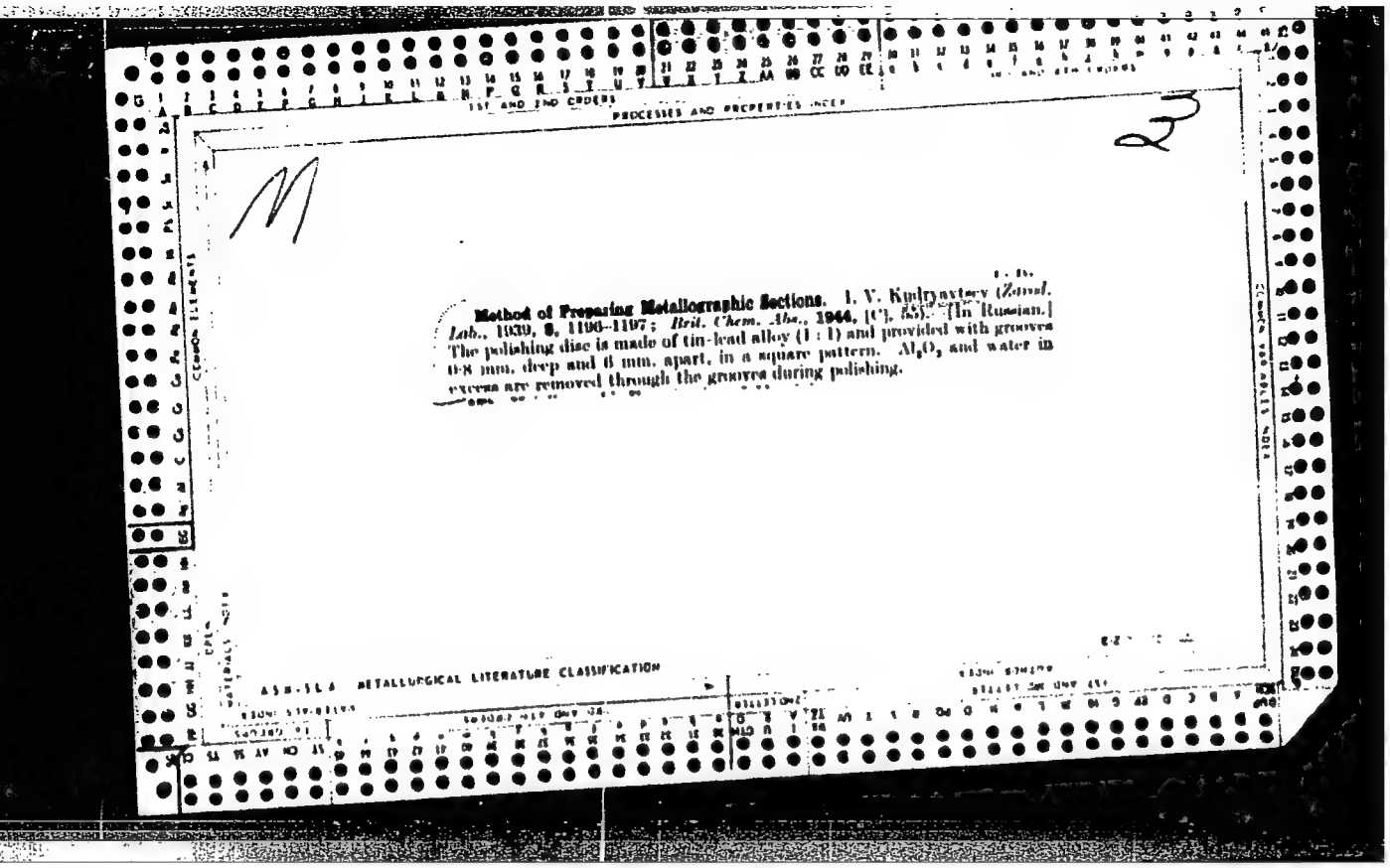

Method of Preparing Metallographic Sections. I. V. Kudryavtsev (*Zavod. Lab.*, 1939, **8**, 1190–1197; *Brit. Chem. Abs.*, **1944**, [C], 85).—[In Russian.] The polishing disc is made of tin–lead alloy (1 : 1) and provided with grooves 0·8 mm. deep and 6 mm. apart, in a square pattern. Al_2O_3 and water in excess are removed through the grooves during polishing.

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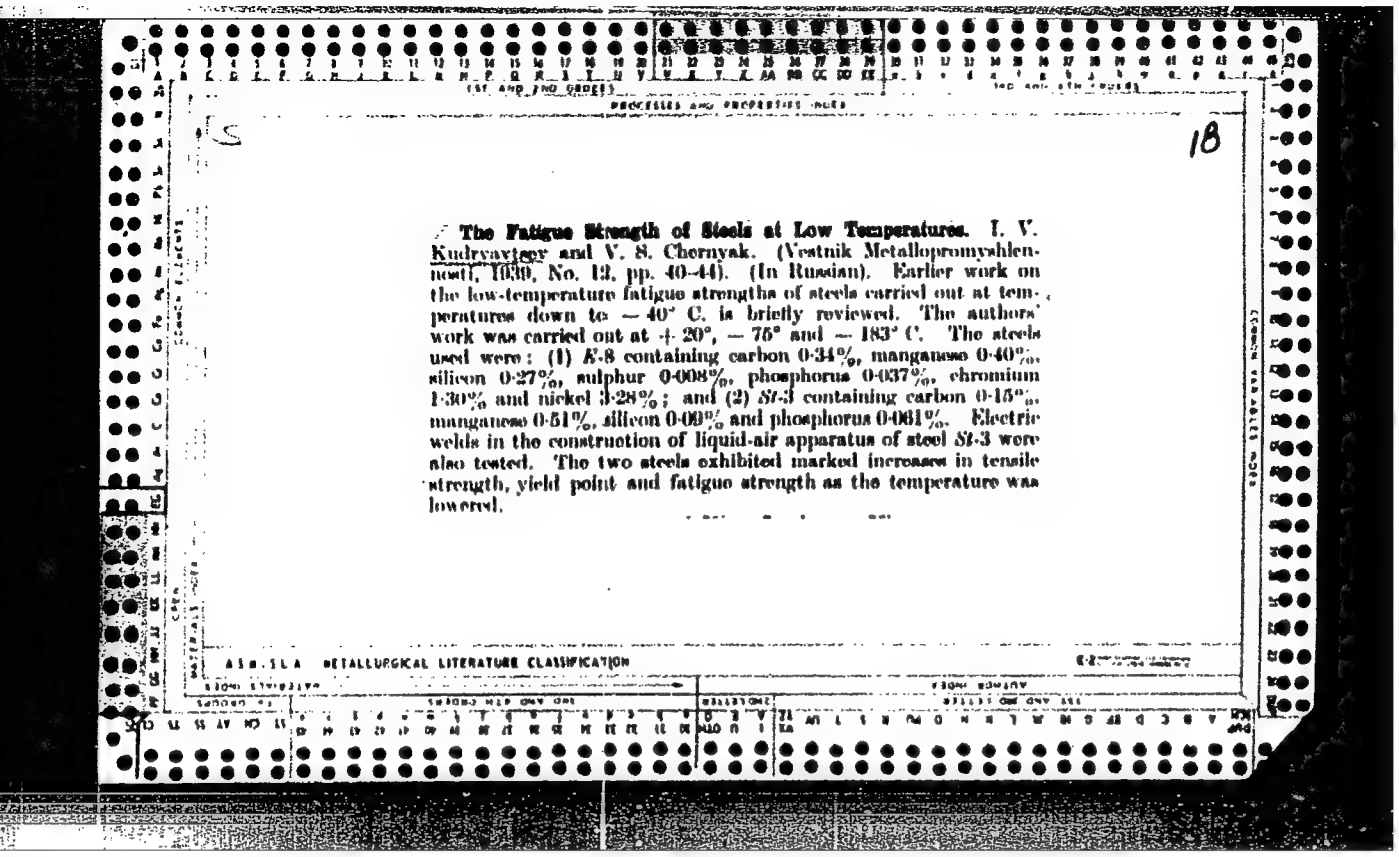

18

The Fatigue Strength of Steels at Low Temperatures. I. V. Kudryavtsev and V. S. Chernyak. (Vestnik Metallopromyshlennosti, 1939, No. 12, pp. 40–44). (In Russian). Earlier work on the low-temperature fatigue strengths of steels carried out at temperatures down to — 40° C. is briefly reviewed. The authors' work was carried out at + 20°, — 75° and — 183° C. The steels used were: (1) *E*-8 containing carbon 0·34%, manganese 0·40%, silicon 0·27%, sulphur 0·008%, phosphorus 0·037%, chromium 1·30% and nickel 3·28%; and (2) *St*-3 containing carbon 0·15%, manganese 0·51%, silicon 0·09% and phosphorus 0·081%. Electric welds in the construction of liquid-air apparatus of steel *St*-3 were also tested. The two steels exhibited marked increases in tensile strength, yield point and fatigue strength as the temperature was lowered.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

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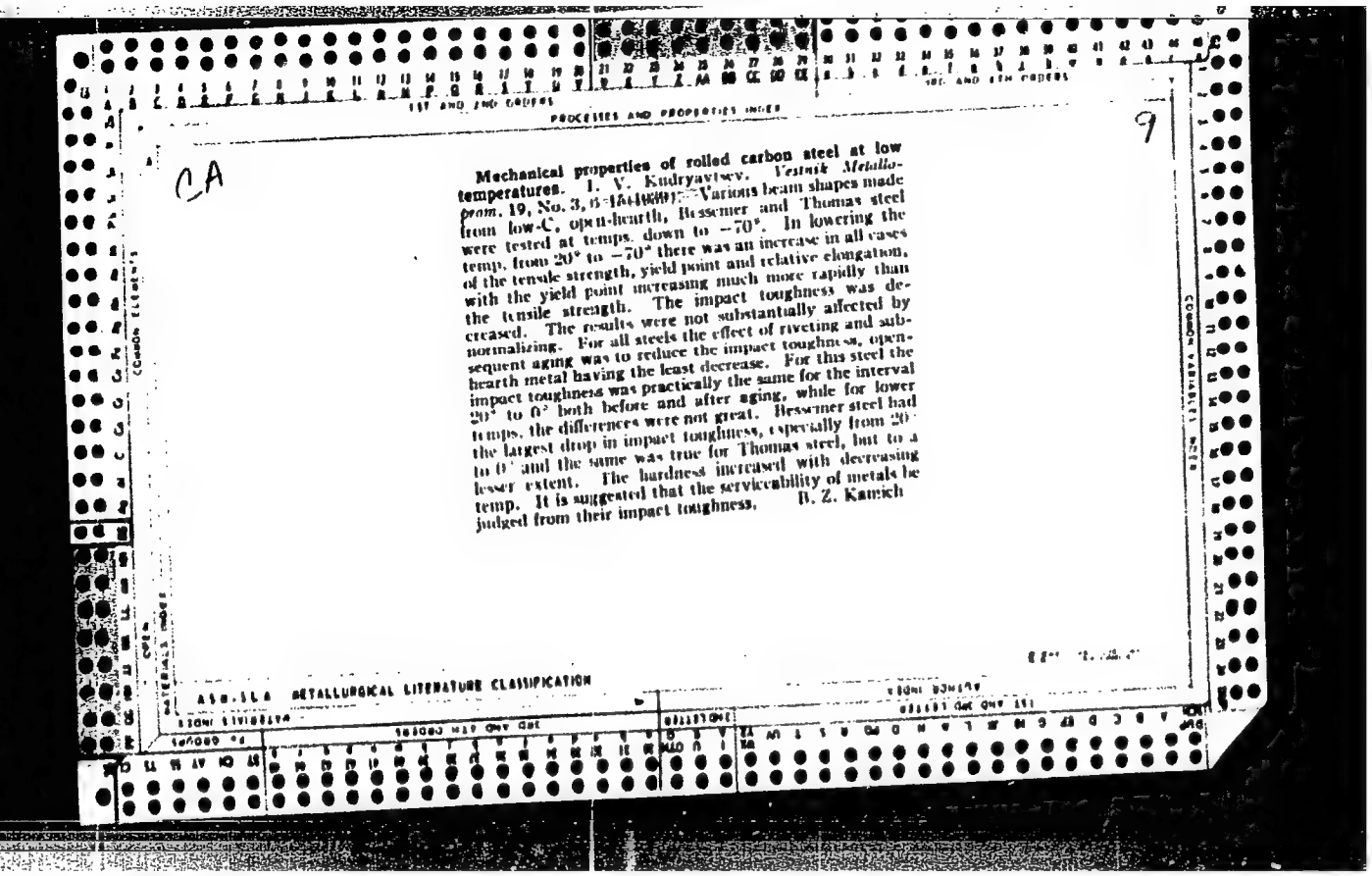

CA

9

Mechanical properties of rolled carbon steel at low temperatures. I. V. Kudryavtsev. *Vestnik Metallo-prom.* 19, No. 3, 6-14(1939).—Various beam shapes made from low-C, open-hearth, Bessemer and Thomas steel were tested at temps. down to −70°. In lowering the temp. from 20° to −70° there was an increase in all cases of the tensile strength, yield point and relative elongation, with the yield point increasing much more rapidly than the tensile strength. The impact toughness was decreased. The results were not substantially affected by normalizing. For all steels the effect of riveting and subsequent aging was to reduce the impact toughness, open-hearth metal having the least decrease. For this steel the impact toughness was practically the same for the interval 20° to 0° both before and after aging, while for lower temps. the differences were not great. Bessemer steel had the largest drop in impact toughness, especially from 20° to 0° and the same was true for Thomas steel, but to a lesser extent. The hardness increased with decreasing temp. It is suggested that the serviceability of metals be judged from their impact toughness. B. Z. Kamich

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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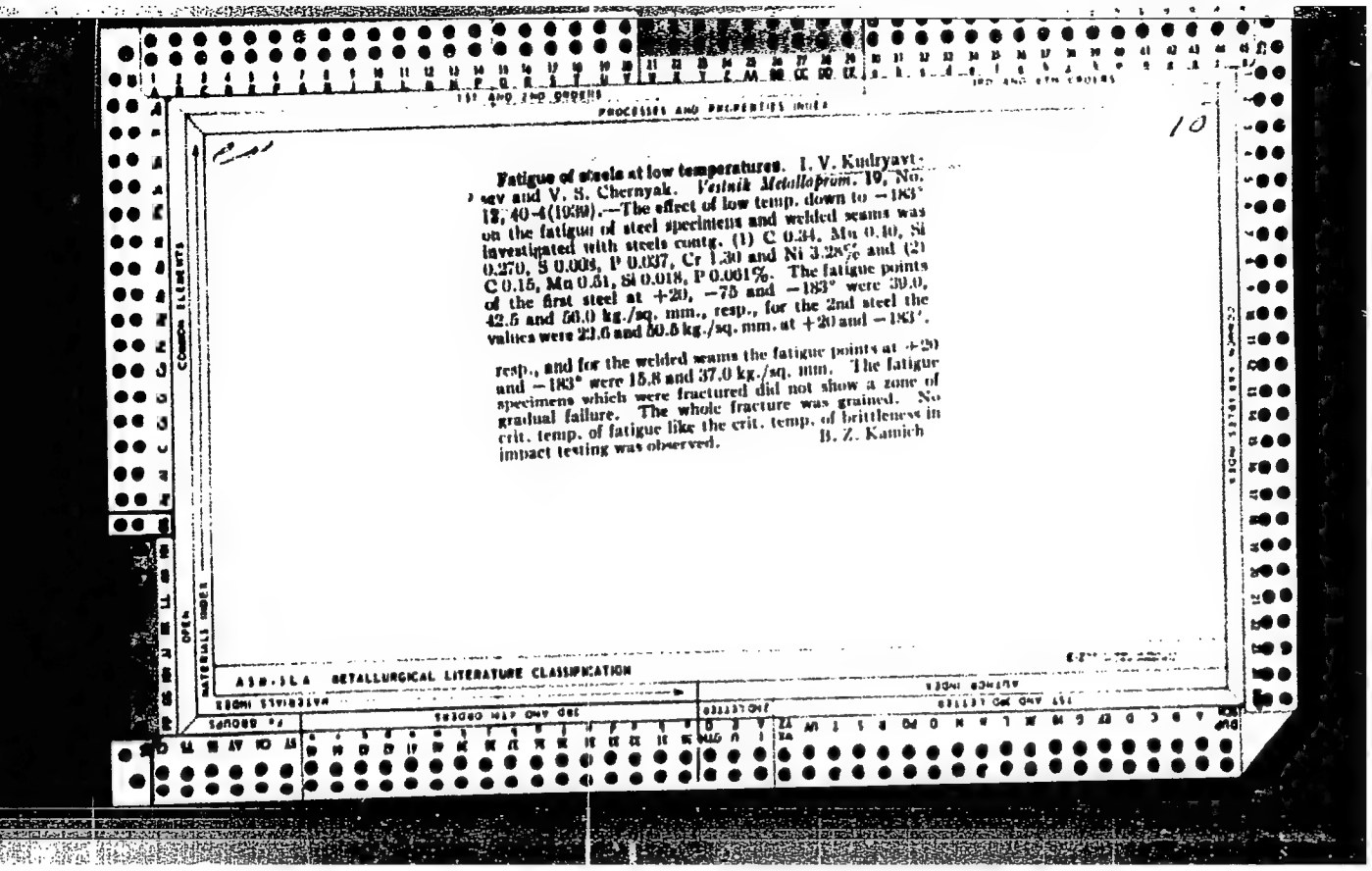

Fatigue of steels at low temperatures. I. V. Kudryavtsev and V. S. Chernyak. *Vestnik Metalloprom.* 19, No. 12, 40-4(1939).—The effect of low temp. down to −183° on the fatigue of steel specimens and welded seams was investigated with steels contg. (1) C 0.34, Mn 0.40, Si 0.270, S 0.008, P 0.037, Cr 1.30 and Ni 3.28% and (2) C 0.15, Mn 0.51, Si 0.018, P 0.001%. The fatigue points of the first steel at +20, −75 and −183° were 39.0, 42.5 and 50.0 kg./sq. mm., resp., for the 2nd steel the values were 22.6 and 50.5 kg./sq. mm. at +20 and −183°, resp., and for the welded seams the fatigue points at +20 and −183° were 15.8 and 37.0 kg./sq. mm. The fatigue specimens which were fractured did not show a zone of gradual failure. The whole fracture was grained. No crit. temp. of fatigue like the crit. temp. of brittleness in impact testing was observed. B. Z. Kamich

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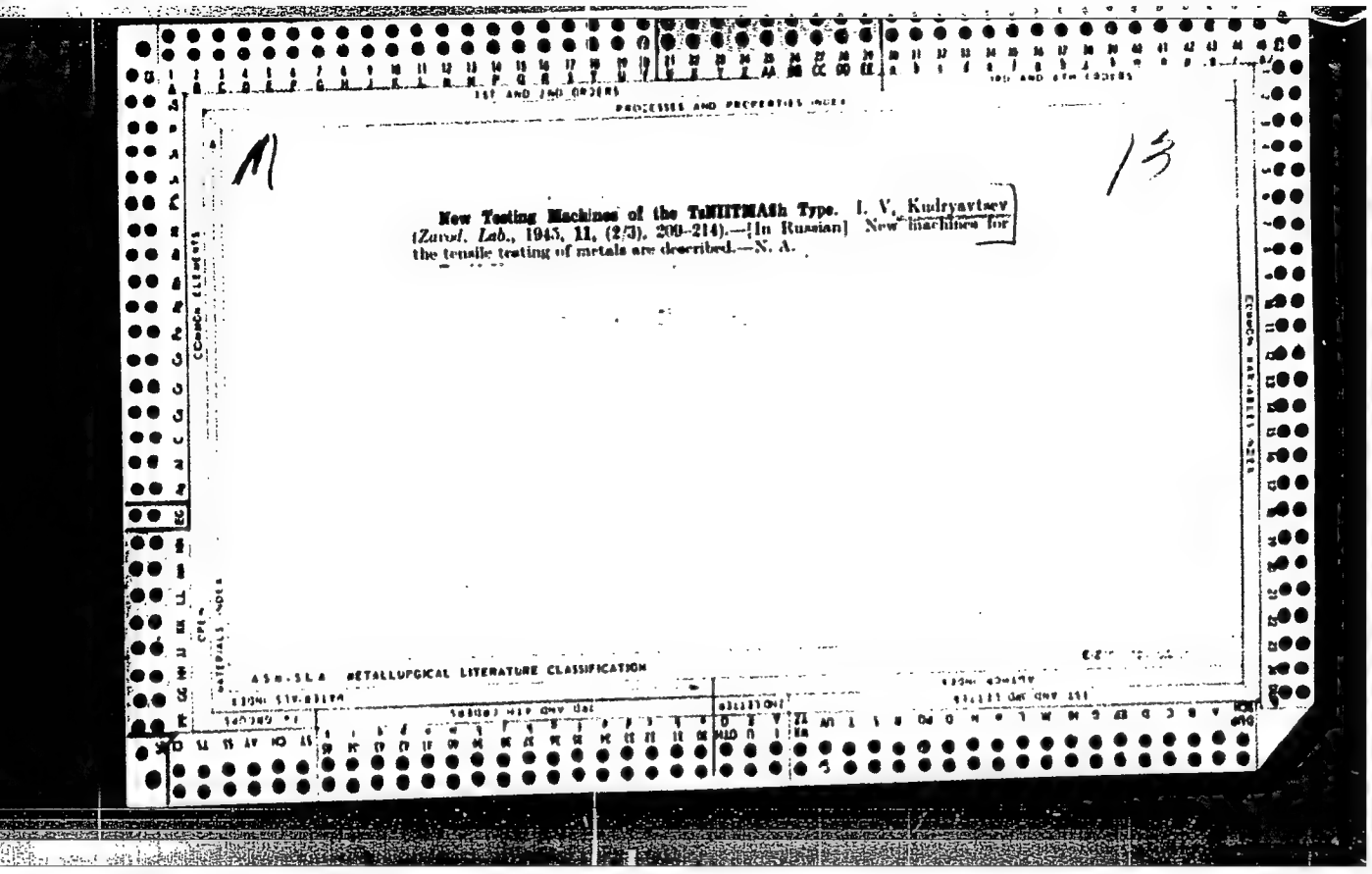

New Testing Machines of the TsNIITMASh Type. I. V. Kudryavtsev (*Zavod. Lab.*, 1945, 11, (2/3), 209–214).—[In Russian] New machines for the tensile testing of metals are described.—N. A.

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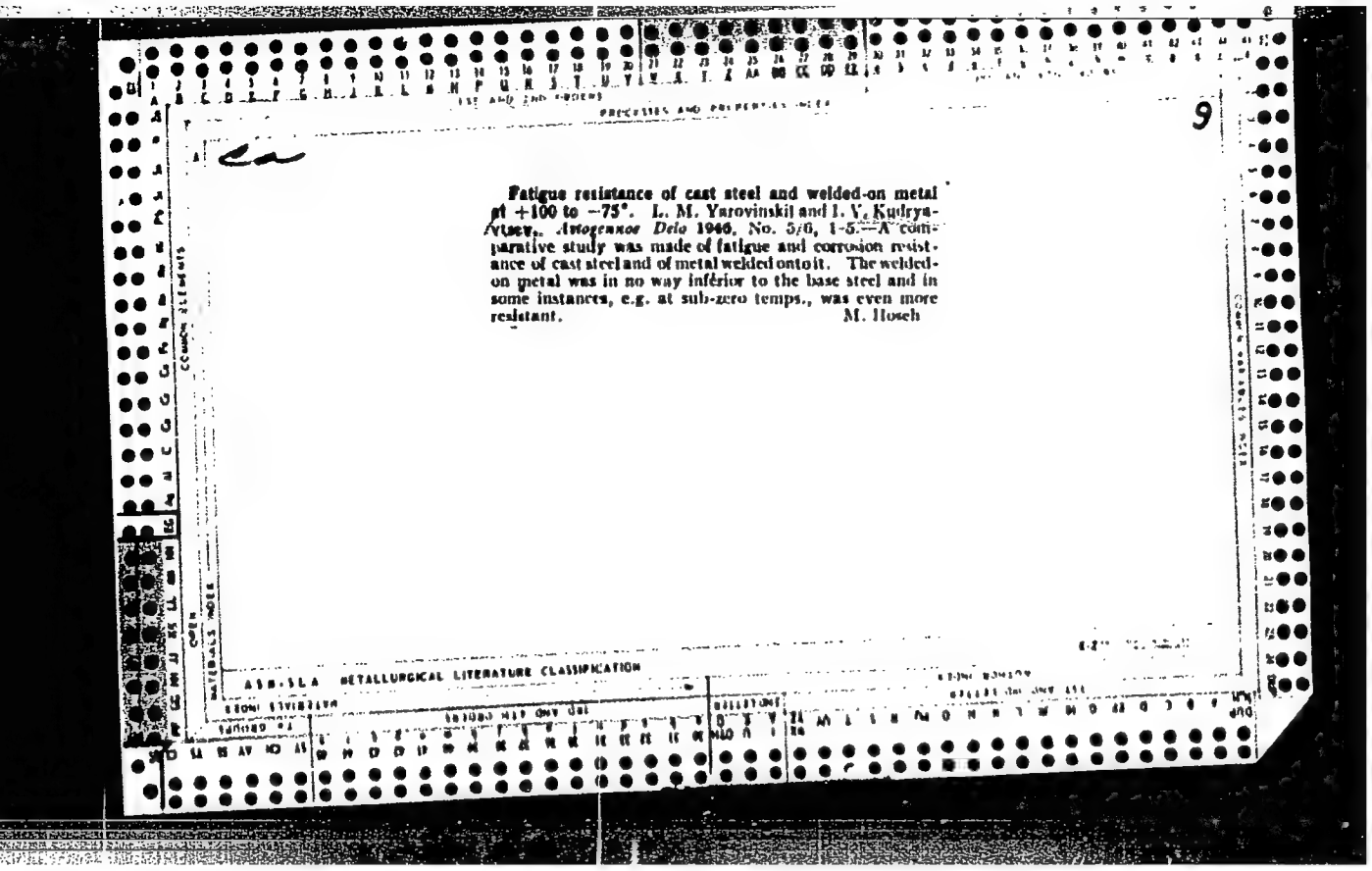

9

Fatigue resistance of cast steel and welded-on metal at +100 to −75°. L. M. Yarovinskii and I. V. Kudryavtsev. *Avtogennoe Delo* 1946, No. 5/6, 1-5.—A comparative study was made of fatigue and corrosion resistance of cast steel and of metal welded onto it. The welded-on metal was in no way inferior to the base steel and in some instances, e.g. at sub-zero temps., was even more resistant. M. Hoseh

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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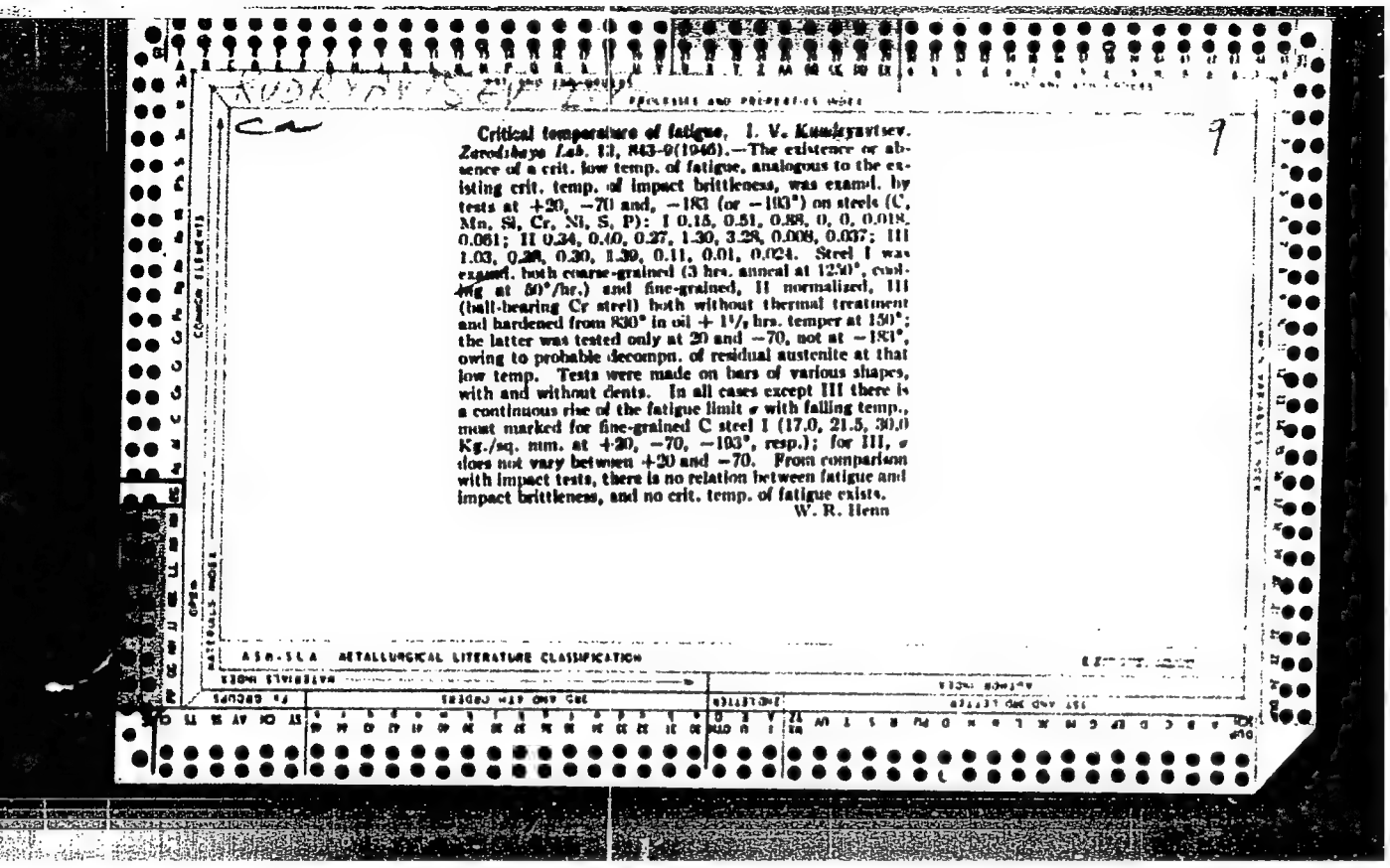

Critical temperature of fatigue. I. V. Kudryavtsev. *Zavodskaya Lab.* 13, 843–9(1946).—The existence or absence of a crit. low temp. of fatigue, analogous to the existing crit. temp. of impact brittleness, was examd. by tests at +20, −70 and, −183 (or −193°) on steels (C, Mn, Si, Cr, Ni, S, P): I 0.15, 0.51, 0.88, 0, 0, 0.018, 0.061; II 0.34, 0.40, 0.27, 1.30, 3.28, 0.008, 0.037; III 1.03, 0.28, 0.30, 1.39, 0.11, 0.01, 0.024. Steel I was examd. both coarse-grained (3 hrs. anneal at 1250°, cooling at 50°/hr.) and fine-grained, II normalized, III (ball-bearing Cr steel) both without thermal treatment and hardened from 830° in oil + 1½ hrs. temper at 150°; the latter was tested only at 20 and −70, not at −183°, owing to probable decompn. of residual austenite at that low temp. Tests were made on bars of various shapes, with and without dents. In all cases except III there is a continuous rise of the fatigue limit σ with falling temp., most marked for fine-grained C steel I (17.0, 21.5, 30.0 Kg./sq. mm. at +20, −70, −193°, resp.); for III, σ does not vary between +20 and −70. From comparison with impact tests, there is no relation between fatigue and impact brittleness, and no crit. temp. of fatigue exists.

W. R. Henn

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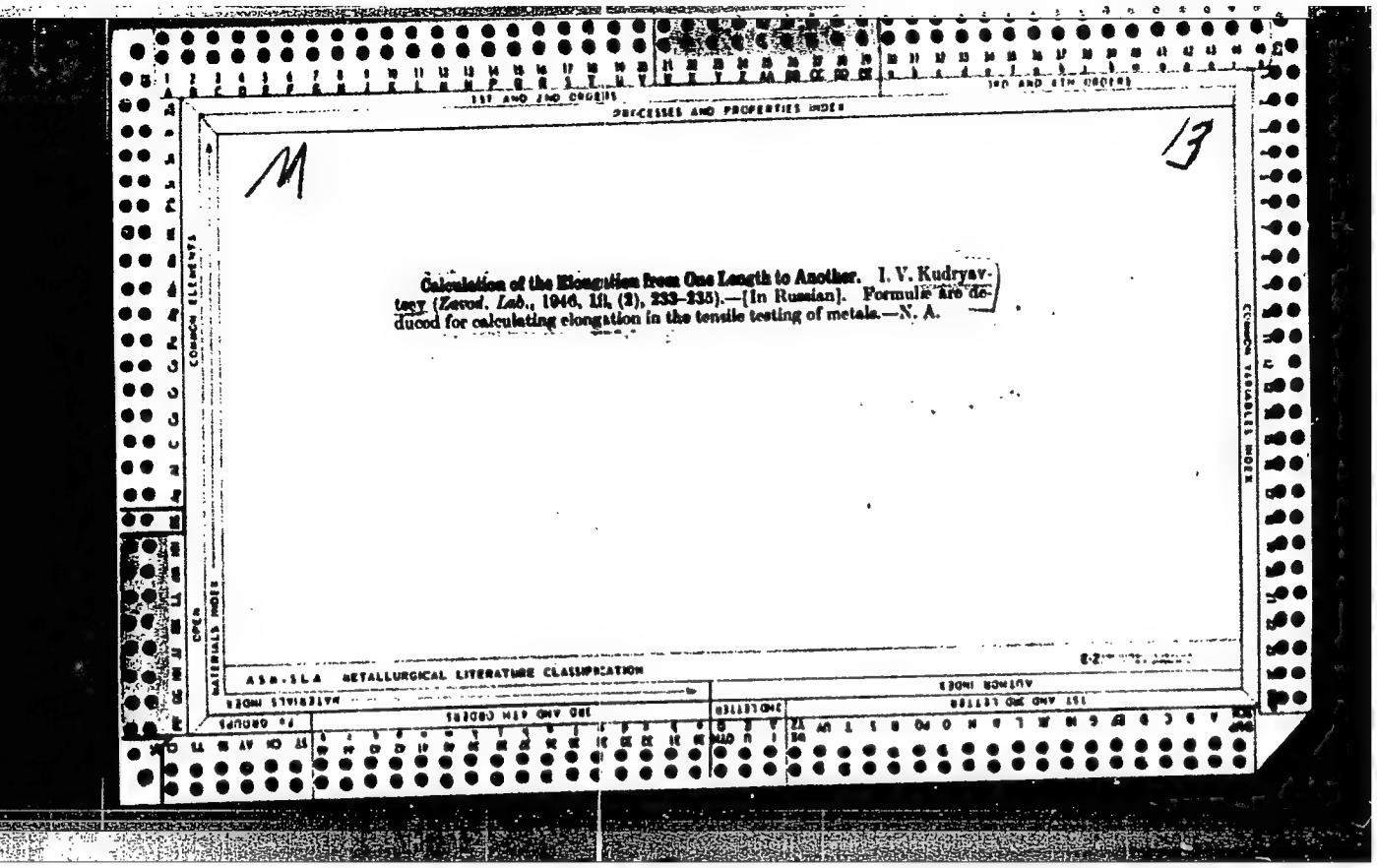

Calculation of the Elongation from One Length to Another. I. V. Kudryavtsev (*Zavod. Lab.*, 1946, 12, (2), 233–235).—[In Russian]. Formulæ are deduced for calculating elongation in the tensile testing of metals.—N. A.

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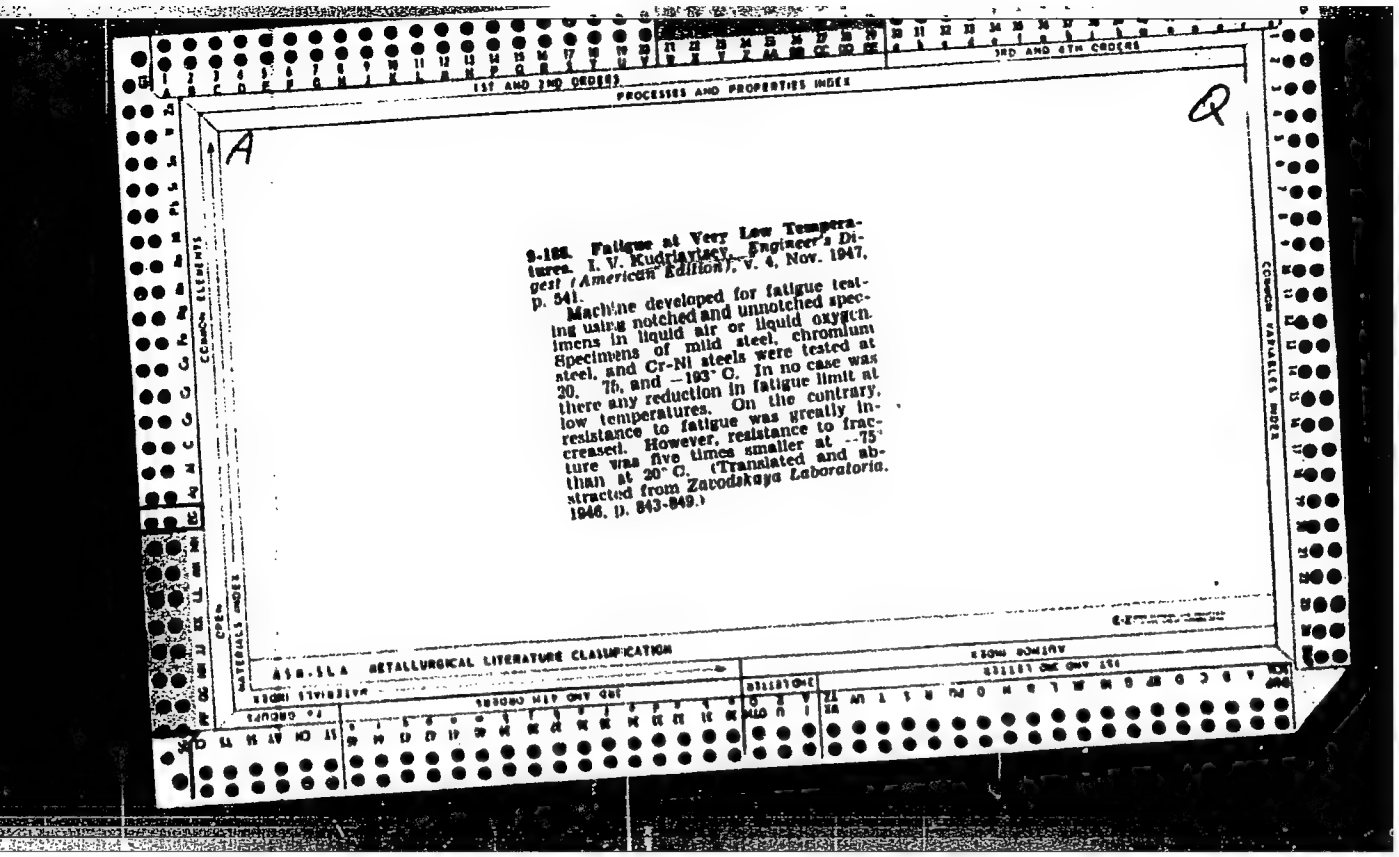

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KUDRYAVTSEV I. V.

Jul 1947

USSR/Tensiometers
Tension

"A New 12-Ton Testing Machine: Type IM-12," I. V. Kudryavtsev, Central Scientific Research Institute of Technology and Machine Construction, 1 p

"Zavodskaya Laboratoriya" No 7

Machine is for conducting static tests on tension under normal as well as high temperatures. Has an automatic recorder of the curve of "load - deformation."

17T55

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.V., kandidat tekhnicheskikh nauk; NOVIKOV, V.N., inzhener.

Investigation of the strength of surface-hardened steel subjected to cyclic loads. Vest.mash.27 no.7:1-12 Jl '47. (MLRA 9:4)
(Strength of materials) (Steel--Testing)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I. V.

"Increasing the Strength of Steel Parts by Roller Working," ITEIN, Moscow, 1948.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRIAVTSEV, I. V. and M. M. SAVERIN and A. V. RIABCHENKOV

Metody poverkhnostnogo uprochneniia detalei mashin. Moskva, Mashgiz, 1949. 220 p. illus.

Bibliography: p. 217-218.

Methods of strengthening the surfaces of machine parts.

DLC: TS320.K8

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I. V.

Strength of ball bearing steel at various temperatures (Investigation of the fatigue properties of a definite type of ball bearing steel under various conditions of operation/compositon: 1.03% C, 0.38 % Mn, 0.3% Si, 1.39% Cr, 0.1%Ni, 0.01 % S and 0.024 % P/). Investigation of the Fatigue Strength of Structural Steels, 120 p. Published by Mashgiz, 1949.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAČEV, I. V.

Influence of residual tensile stresses on the fatigue strength of smooth and notched specimens (the author produced tensile stresses in the specimens by heat treatment. The fatigue strength of the notched specimens were considerably lower if the notches were made before producing the tensile stresses, but if these were made on a specimen which already had residual tensile stresses these showed no adverse effect, probably due to deformation in the affected zone).

Investigation of the Fatigue Strength of Structural Steels, 120 p., Published by Mashgiz, 1949.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I-V.

(see also card 2)

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 585 - I

Call No.: AF423519

BOOK

Author: KUDRYAVTSEV, I. V., Kand. of Tech. Sci., ed.
(For individual authors see "Coverage")

Full Title: INVESTIGATION OF STEEL STRENGTH AND RESISTANCE

Transliterated Title: Issledovaniya prochnosti stali

PUBLISHING DATA

Originating Agency: Ministry of Heavy Machine-Building, USSR. Central Scientific Research Institute of Technology and Machine-Building (TsNIITMASH)

Publishing House: State Scientific and Technical Publishing House of Machine-Building Literature (Mashgiz)

Date: 1951 No. pp.: 256 No. of copies: 3,000

Editorial Staff: None

PURPOSE: This symposium is intended for a wide range of engineers, technologists and designers.

TEXT DATA

Coverage: This symposium contains twelve articles dealing with recent work of the TsNIITMASH on the strength of materials and machine elements. The first six articles discuss the problems of surface strengthening. The other articles deal with the theory and design of testing machines and devices. The authors describe their experience and research work, present their new methods for increasing the

1/3

TRANSLATION W23621, 21 Aug 52

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

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Issledovaniya prochnostistali

surface stability and their new designs for testing machines. The book is provided with many illustrations, tables and diagrams.

Saverin, M. M., Kand. of Tech. Sci., Determination of Residual Stresses occuring at Shot Blasting. 4 references, 3 Russian, 1887-1949 (p. 6)

Kudryavtsev, I. V., Kand. of Tech. Sci., Fatigue Strength of Steel Objects with Fine Surface Cracks. 9 Russian references, 1933-1949 (p. 33)

Saverin, M. M., Kand. of Tech. Sci., and Zavartseva, V. M., Eng., Using the Optical Method for Analyzing the Distribution of Residual Stresses during the Surface Strengthening of Machine Elements. Nc references. (p. 60)

Kudryavtsev, I. V., Kand. of Tech. Sci. and Savko, L. I., Eng., Effect of Surface Hardening by High-Frequency Currents and of the Following Rolling on the Fatigue Strength of Steel. 2 Russian references, 1947, 1949 (p. 94)

Kobrin, M. M., Eng., Strengthening of Cast Steel by Means of Surface Cold Hardening. 7 Russian references, 1935-1949 (p. 102)

Vidman, D. N., and Kudryavtsev, I. V., Kand. of Tech. Sci., Increase in Strength of the Law-Pressure Cylinder of a 35,000-kw Turbine Welded Rotor. 4 Russian references, 1948-1951 (p. 122).

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

Issledovaniya prochnosti stali AID 585 - I

Prosvirin, V. I., Dr. of Tech. Sci. and Morgunova, N. N., Eng., Instrument for Determining the Relative Damping of Vibrations. 3 Russian references, 1943-1947 (p. 127)
Kheyfets, S. G., Kand. of Tech. Sci., Investigation of the Fatigue Strength of Steel caused by Bending in an Asymmetrical Load Cycle. No references (p. 134)
Kulikov, O. O., Eng., Resonance Torsion Machine for Endurance Tests. 9 references, 8 Russian, 1932-1950 (p. 147)
Kheyfets, S. G., Kand. of Tech. Sci., Selection of Testing Machine Characteristics and of the Permissible Pulsations of Samples in Endurance Testing. No references (p. 178)
Saverin, M. M., Kand. of Tech. Sci. and Zavartseva, V. M., Eng., Using the Optical Method of Measuring Stresses for Solving Elactic-Plastic Contact Problems. 2 Russian references, 1946 (p. 196)
Brumberg, R. M., Eng., Combined Bending and Axial Stress of a Beam with a Flat Side Support. No reference (p. 223)

No. of References: See "Coverage"
Facilities: TsNIITMASH

3/3

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I. V.

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 586 - I

Call No.: TA473.K77

BOOK
Author: KUDRYAVTSEV, I. V.
Full Title: RESIDUAL STRESSES AS A SAFETY FACTOR IN MACHINE CONSTRUCTION
Transliterated Title: Vnutrenniye napryazheniya kak rezerv prochnosti v mashinostroyenii

PUBLISHING DATA
Originating Agency: None
Publishing House: State Scientific and Technical Publishing House of Machine-Building Literature (Mashgiz)
Date: 1951 No. pp.: 278 No. of copies: 4,000
Editorial Staff
Editor: Pronin, B. A.

PURPOSE: The book is intended for designers and technologists in machine-building enterprises, as well as for workers of scientific-research institutes.

TEXT DATA
Coverage: The effect of residual stresses on the strength and endurance of machine elements is examined in this book. The author analyzes different theories (e.g., those of S. V. Serensen, I. A. Oding, N. N. Afanas'yev) and suggests his own theory on the fatigue endurance limit under combined stress conditions, based on experimental investigations. He discusses different methods of creating favorable

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

Vnutrenniye napryazheniya kak rezerv prochnosti v mashinostroyenii

residual stresses which increase considerably the resistance of steel parts to fatigue and reduce their sensitivity to incisions. The book is provided with illustrations, tables and diagrams.

No. of References: Total 198; 146 Russian, 1929-1950.

Facilities: Central Scientific Research Institute of Technology and Machine Building (TsNIITMASH); E. P. Unksov, Director of TsNIITMASH; A. V. Ryabchenkov, Kand. of Tech. Sci.; M. M. Kobrin, Eng; Technicians A. S. Karel'skaya and M. I. Nagornaya; Foremen I. N. Balandin and N. A. Lopatinskiy.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRIAVTSEV, I. V. and A. V. RIABCHENKOV

Kratkovremennoe azotirovanie konstruktsionnoi stali dlia povysheniia ustalostnoi prochnosti. (Vestn. Mash., 1951, no.3, p. 27-33)

Includes bibliography.

Brief nitration of structural steel for increasing fatigue strength.

DLC: TN4.V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I. V.

USSR/Metals - Steel, Welding, Fatigue Apr 51

"Increasing the Fatigue Strength of Welded Joints by Surface Cold Working," I. V. Kudryavtsev, Cand Tech Sci

"Avtogen Delo" No 4, pp 8-12

Investigations proved considerable influence of residual stresses on fatigue strength and service life of machine parts. Expts established very high effectiveness of cold working the surface by rolling or shot peening as a means for improving fatigue strength. But these methods cannot be

197T66

USSR/Metals - Steel, Welding, Fatigue Apr 51 (Cont'd)

used in application to large constructions. Authors developed a method for cold working the surface of welded joints and adjacent zones with pneumatic hammers.

197T66

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I. V.

USSR/Metals - Cast Iron, Properties Oct 51

"Effect of Surface Hardening on the Fatigue Limit of High-Strength Cast Iron," Prof I. V. Kudryavtsev, Dr Tech Sci, N. M. Savvina, Engr, TsNIITMASh

"Litey Proizvod" No 10, pp 18-22

Expts for studying effect of surface hardening by shot peening, rolling and case hardening on endurance of cast irons revealed no pos results for gray cast iron, but fatigue limit of high-strength cast iron was considerably increased. Latter factor may have important

198T69

USSR/Metals - Cast Iron, Properties (Contd) Oct 51

significance for crankshafts, increasing wear-resistance of metal. Illustrated by numerous diagrams and micrographs.

198T69

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

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13

1351* **Increase of Fatigue Strength of Welded Joints by Surface Peening.** I. V. Kudriatsev and N. M. Savvina. *Avtogennoe Delo*, v. 22, Apr. 1951, p. 8-12.

Cylindrical, plate, and channel-beam fatigue specimens were prepared by butt and lap arc-welding and were given various stress relief and peening treatments. Data are discussed, tabulated and charted. 11 ref.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.U.

USSR

Dependence of steam quality on salt content of feed water. I. V. Kudryavtsev and K. M. Kazanskii. *Elek. Stantsii* 23, 13, 14(Mar., 1952); *Fuel Abstr.* 13, No. 5, 90-1(1953). — Deterioration in steam quality is not caused by deterioration in the quality of the softened water. As shown by alky. and salinometer readings, only an increase in the NH_3 content is involved in such cases. K. L. C.

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I. V., KAZANSKIY, I. M.

Steam Turbines

Strengthening a turbine rotor shaft and redesign of its end packing. Elek. sta. 23 no. 3, 1952, Inzh.

SO: Monthly List of Russian Accessions, Library of Congress, July 1953, Uncl.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I. V.

The Committee on Stalin Prizes [of the Council of Ministers USSR] in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953: (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Apr 1954)

Name	Title of Work	Nominated by
Kudryavtsev, I.V. Saverin, M.M. Ryabchenkov, A.V.	"Studies in the Field of Substantiating the Technology of Machine Building"	Ministry of Transport and Heavy Machine Building

SO: W-30004, 7 July 1954

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I. V.

The influence of remanent stresses on the cold brittleness of steel. I. V. Kudryavtsev. *Zhur. Tekh. Fiz.* 23, 1654-8 (1953). Samples of steel contg. C 0.14, Si 0.32, Mn 0.41, S 0.02, and P 0.013% were annealed for 1 hr. at 600°. Some of these samples were heated by high-frequency current to 700–750° to a depth of 1.5–2 mm. and cooled with cold water. Other samples were stressed by a jet of Fe shot for 5 min. The remanent stresses in the last 2 cases were of opposed sign, and their magnitude was calcd. Tests made on brittleness as a function of temp. showed that the crit. temp. of embrittlement did not depend on remanent stress.

S. Pakswer

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.V., doktor tekhnicheskikh nauk; YATSKEVICH, S.I., kandidat tekhnicheskikh nauk.

Strengthening shafts at the location of regulating wheels by means of surface hardening. Vest.mash. 33 no.10:68-71 O '53. (MLRA 6:10)
(Shafting) (Steel--Cold working)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

GINTSBURG, Ya.S., kandidat tekhnicheskikh nauk; KUDRYAVTSEV, I.V., professor, doktor tekhnicheskikh nauk, retsenzent; GEL'MERMAN, L.Sh., kandidat tekhnicheskikh nauk, redaktor.

[Testing of metals at high temperatures] Ispytaniia metallov pri povyshennykh temperaturakh. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1954. 251 p. (MLRA 7:8)
(Metals--Testing) (Metals at high temperatures)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.V., Ed.

Konstruktsionnaya Prochnost' Staley (Structural Strength of Steel) Moskva, Mashgiz, 1954.
221 P. Illus., Diagrs., Tables (Russia. Ministerstvo Transportnogo I Tyazhelogo Mashinostroyeniya, Kniga 63)

SO: N/5
668.463
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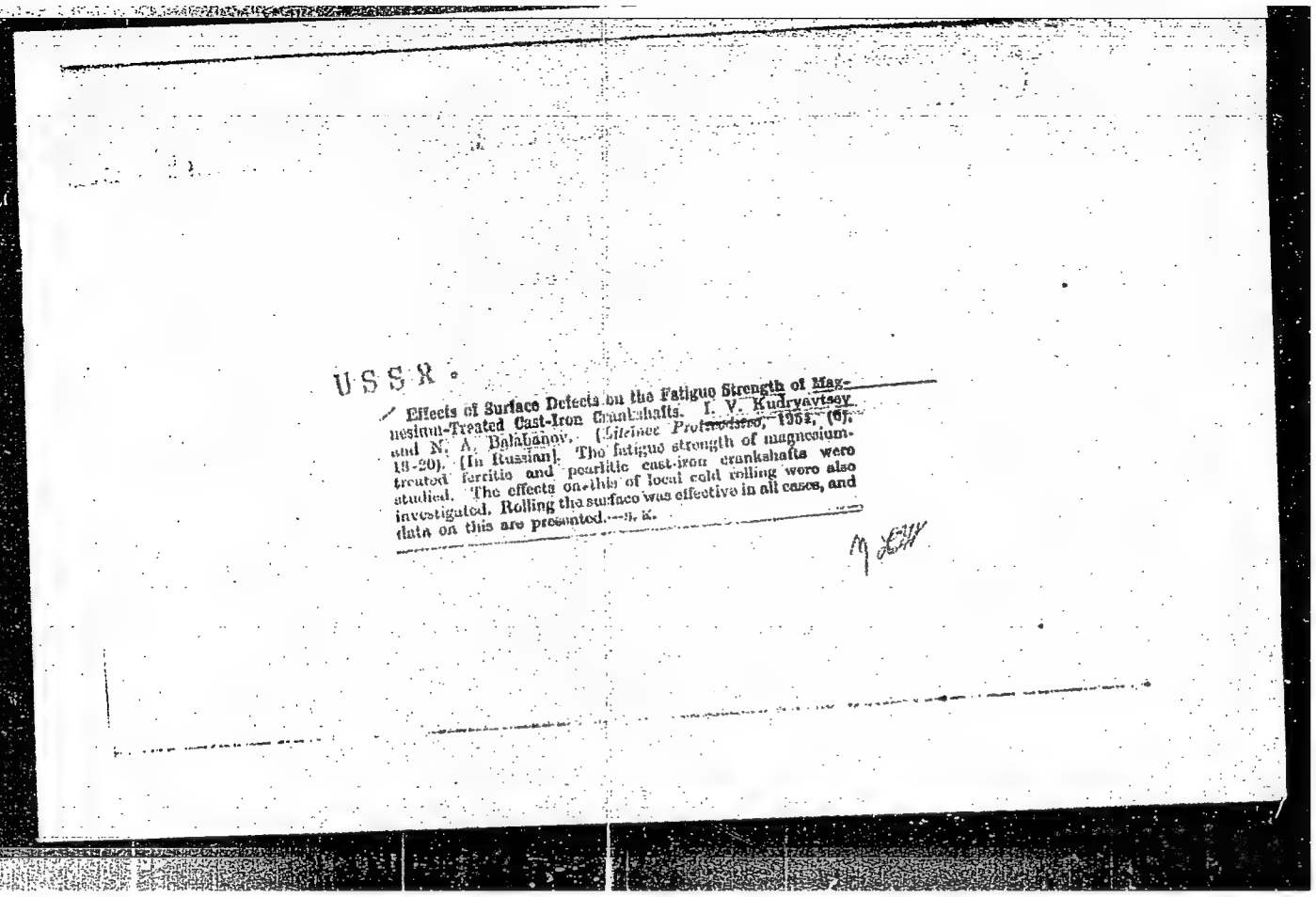

USSR

Effects of Surface Defects on the Fatigue Strength of Magnesium-Treated Cast-Iron Crankshafts. I. V. Kudryavtsev and N. A. Bolshanov. (*Liteinoe Proizvodstvo*, 1954, (6), 19-20). (In Russian). The fatigue strength of magnesium-treated ferritic and pearlitic cast-iron crankshafts were studied. The effects on this of local cold rolling were also investigated. Rolling the surface was effective in all cases, and data on this are presented.—S. K.

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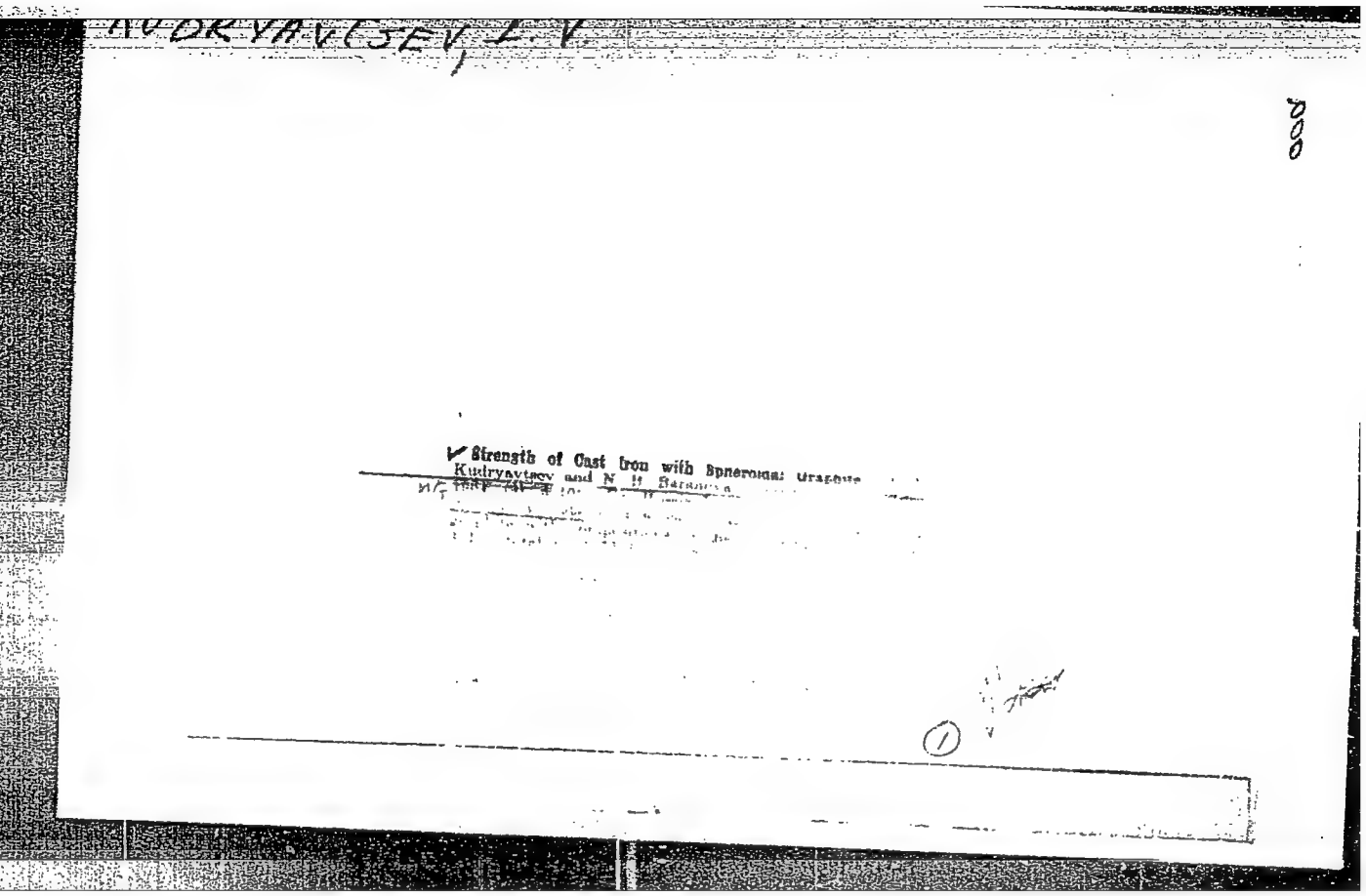

Strength of Cast Iron with Spheroidal Graphite
Kudryavtsev and N. N. Barsukova

(1)

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USSR, Physics - Steel, Stress

FD 362

Card 1/1

Author : Kudryavtsev, I. V. and Savvina, N. M.

Title : Preservation of the effect of residual stresses on the fatigue strength of steel parts during their prolonged storage

Periodical : Zhur. tekh. fiz. 24, 412-416, Mar 1954

Abstract : Investigation consisted in tracing variation of endurance during 2-year aging of 2 types of carbon steel, with concentrated stresses (with incisions) and without them. Prolonged storage of steel parts with residual stresses produced by superficial rolling does not affect endurance of steel.

Institution :

Submitted : September 22, 1953

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USSR/Engineering - Fatigue in cast iron

Card : 1/1

Authors : Kudryavtsev, I. V., Dr. Tech. Sc., Prof.; Balabanov, N. A., Engineer

Title : Fatigue in cast-iron crankshafts

Periodical : Vest. Mash., 34, Ed. 6, 61 - 64, June 1954

Abstract : The economy effected by using cast-iron shafts in place of forged steel is stressed, especially, since the obstacle of the lesser durability of cast iron can be removed by the use of a new high-strength cast iron which can be further improved by surface treatment. The results of experiments are compiled and evaluated, such experiments including the applying of various strains to six types of shafts. Six Russian references, latest 1954. Graphs; tables; drawings; illustrations.

Institution : ...

Submitted : ...

Translation B-79031, 22 Sep 54

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KUDRYAVTSEV, I.V., professor, doktor tekhnicheskikh nauk

Structural strength of steel. [Trudy] TSNIITMASH no.63:3-222 '54.
(Steel alloys)

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KUDRYAVTSEV, I.V., doktor tekhnicheskikh nauk; SAVVINA, N.M., kandidat tekhnicheskikh nauk.

Determination of the efficiency of surface hardening of machine parts with transverse holes. [Trudy] TSNIITMASH no.63:62-78 '54. (MLRA 7:9)

(Machinery) (Steel alloys--Hardening)

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KUDRYAVTSEV, I.V., doktor tekhnicheskikh nauk: YATSKEVICH, S.I.
kandidat tekhnicheskikh nauk.

Cold hardening of shafts in the vicinity of the adjusting ring.
[Trudy] TSNIITMASH no. 63:79-85 '54. (MLRA 7:9)
(Shafts and shafting) (Steel alloys--Hardening)

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Ustalostnaya Prochnost' i Ostatochnyye Napryazheniya v Stali i Chugune
(Fatigue Strength and Residual Stresses in Steel and Cast Iron)
Moskva, Mashgiz, 1955.
152 p. illus., diagrs., graphs
(Moscow. Tsentral'nyy Nauchno-Issledovatel'skiy Institut Tekhnologii i Mashinostroyeniya, Knига 70)
Includes bibliographies.
At head of title: Russia, Ministerstvo Tyazhelogo Mashinostroyeniya.

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KUDRYAVTSEV, I. V.

USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Compounds, E-9

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34880

Author: Kudryavtsev, I. V.

Institution: None

Title: Fatigue Strength of Steel Parts in Locations Where the Surface Layer Is Sharply Torn

Original Periodical: Collection: Ustalostnaya prochnost' i ostatochnyye napryazheniya v stali i chugune, Moscow, Mashgiz, 1955, 82-85

Abstract: None

Card 1/1

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I. V.

USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Compounds, E-9

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34883

Author: Kudryavtsev, I. V., Savina, N. M.

Institution: None

Title: Strengthening Cast Iron Parts with Spheroidal Graphite by Surface Working

Original Periodical: Collection: Ustalochnaya prochnost' i ostatochnyye napryazheniya v stali i chugune, Moscow, Mashgiz, 1955, 99-120

Abstract: None

Card 1/1

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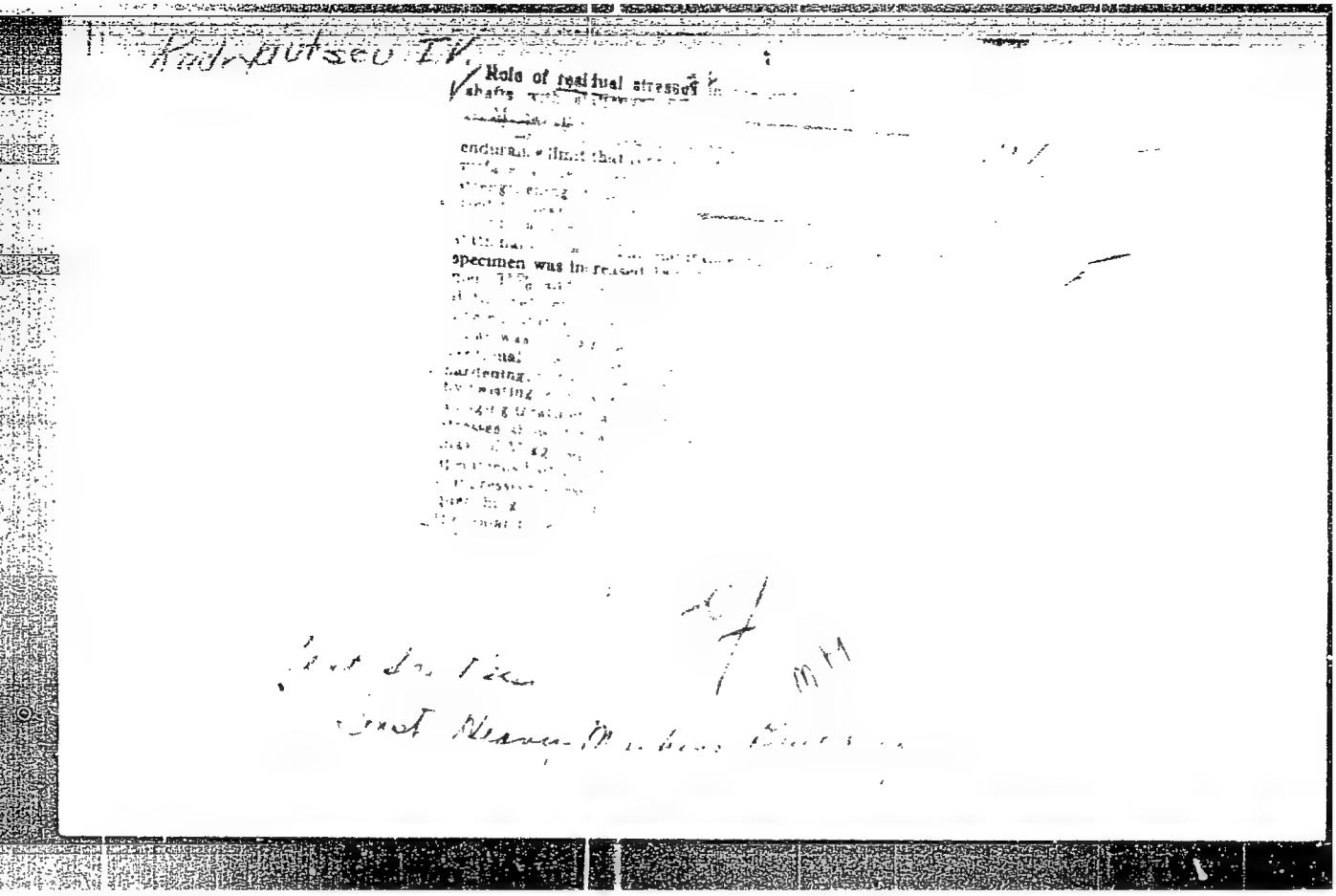

Role of residual stresses

specimen was in

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KUDRYAVTSEV, I.V.

693

3644 Fatigue Strength of [illegible]

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KUDRYAVTSEV, I.V., professor, doktor tekhnicheskikh nauk; SAVVINA, N.M. kandidat tekhnicheskikh nauk; ZAYTSEV, G.Z., inzhener

Stability of the effect of residual stress in fatigue strength of steel parts (at the time and under the influence of varying loads) [Trudy] TSNIITMASH no.70:5-22 '55. (MLRA 8:11)
(Steel, Structural--Fatigue)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.V., professor, doktor tekhnicheskikh nauk

Fatigue strength of a work-hardened surface layer of steel parts where treated areas end abruptly. [Trudy] TSNIITMASH no.70:82-85 '55. (MLRA 8:11)

(Steel--Heat treatment)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.V.

KUDRYAVTSEV,I.V., professor, doktor tekhnicheskikh nauk; SAVVINA,N.M., kandidat tekhnicheskikh nauk

Strengthening cast iron part surfaces with spheroidal graphite. [Trudy] TSNIITMASH no.70:99-120 '55. (MLRA 8:11)
(Cast iron--Metallurgy)

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"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827210015-5

KUDRYAVTSEV, I.V., doktor tekhnicheskikh nauk; BALABANOV, N.A., kandidat tekhnicheskikh nauk.

Fatigue strength of steel or cast iron crankshafts and the increase of their durability by fillet rolling.[Trudy] TSNIITMASH no.74:5-20 '55. (MLRA 9:1)

(Crankshafts) (Steel--Cold working) (Cast iron--Cold working)

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